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SECOND
SUPPLEMENT TO
SITE ASSESSMENT EVALUATION
AND
PROPOSED REMEDIAL ACTION PLAN

for
THE MONADNOCK COMPANY
18301 E. Arenth Avenue
PO Box 1222
City of Industry, CA 91749

22 June 1987

by
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TABLE OF CONTENTS
SECOND SUPPLEMENT

SECTION A
BACKGROUND

A.1 Setting

The Monadnock Company is a manufacturer of small parts and fasteners for the aircraft/aerospace industry located in the City of Industry, CA at 18301 East Arenth Avenue. Formerly the Monadnock Division of TRW-Cinch, the Company is now owned by Mr. Charles M. Miller, President.

Mr. Miller is in the process of trying to sell the business. As a stipulation of an earlier prepurchase agreement, a prospective buyer required that an investigation be made of subsurface conditions beneath the site relative to the possible presence or absence of toxic or hazardous contaminants.

The Monadnock site is located within the Puente basin, a relatively narrow alluvium valley through which San Jose Creek flows. San Jose Creek is now fully contained in a reinforced concrete open channel storm drain. Because the concrete open channel is subject to high ground water conditions, its bottom slab is underdrained. Ground water adjacent to the concrete open channel may find its way into the channel through this underdrain system. San Jose Creek drains westward from the Pomona area into the southern San Gabriel Valley.

The total area of the property is approximately 7.33 acres. Prior to 1963, the property was used for cultivated agriculture.

The building on the site was originally built in 1963 and housed a ribbon mill from 1963-1965. The Monadnock Division of TRW-Cinch bought the property in 1966. Since that time the building has been expanded. The building is rectangular in plan, and is a single-story structure with a concrete floor and walls. The total floor area of the building is approximately 47,500 square feet. Concrete and asphalt paving surround the building such that the total impervious area of building and pavement is approximately 3.61 acres. The remaining 3.72 acres of the property remains undeveloped and its surface is uncultivated, dormant earth.

Old aerial photographs indicate that an intermittent stream meandered across the site from east to west on its way to join Jan Jose Creek before San Jose Creek was confined in a concrete channel. The stream was filled in across all of the site and portions of the present Monadnock building are constructed over it.

A.2 Earlier Work and Reports

In July 1986, the Monadnock Company engaged the firm of Dames & Moore to conduct a preliminary site assessment. After receiving the report of findings from Dames & Moore on August 15, 1986, the Company engaged Ralph Wagner, Consulting Engineer, to review the Dames & Moore report and arrange for additional exploration and testing.

The results of the Dames & Moore monitoring well sampling and soil boring program conducted from July 23 to July 26, 1986, and a similar, but more extensive, monitoring well sampling and soil boring program conducted by Chemical Consultants, under the supervision of

Ralph Wagner, from 16 September to 15 October 1986, were presented to the Los Angeles Regional Water Quality Control Board in a "Site Assessment Evaluation and Proposed Remedial Action Plan for the Monadnock Company", dated 20 October 1986, prepared by Ralph Wagner.

Upon review of the initial presentation, staff of the Regional Board orally requested certain additional information, as follows.

1. Location of the existing plating waste treatment facility in relation to monitoring well MW-2.

2. Evidence of any pollution of ground water by leakage of the plating waste treatment facility, such as might be indicated by the presence of heavy metals in MW-2, B-1 and B-5.

3. History of chemical use at the facility both as to characteristics and timetable.

4. Advisability of installing an additional piezometric type of sampling well downgradient of the Monadnock site to rule out possible migration of ground water contaminants to either the Ajax or Carrier Corp. sites.

5. Likely trace of former, intermittant waterway crossing the Monadnock site in an east-west direction.

In addition, the current owner had commenced the removal and legal disposal of about 120 cubic yards of contaminated soil from an area of the site suspected to have been the point of storage, leakage or dumping of industrial solvents by the prior owner between 1966 and 1972.

Therefore, a "Supplement to Site Assessment Evaluation and Proposed Remedial Action Plan for the Monadnock Company" was submitted to the Regional Board by letter dated 17 November 1986 in order to answer all of these additional questions and to provide information and test data relative to the soil removal program.

A workplan was submitted on January 14, 1987, as requested by staff of the Regional Board, to address soil and ground water contamination at Monadnock. This workplan consisted of the description of an expansion of on-site ground water monitoring and further development of hydrogeologic parameters. An additional 6 monitoring wells were proposed in the workplan, with descriptions of monitoring well construction and development approach.

A.3 Requests by Regional Board

By letter dated February 27, 1987, the staff of the Regional Board requested that an amended workplan be submitted addressing the following concerns:

"1) Discuss the approach that will be taken to derive the following information from the combined suite of old and new wells:

   a) Vertical and lateral geometry of the upper aquifer.

b) Effect of the channel deposits and artificial fill on the site's potentiometric surface.

c) Details of site hydrostratigraphy and on-site hydraulic conductivity.

d) Vertical and lateral variations in hydraulic parameters such as conductivity.

e) Direction and rate of ground water over the entire site.

f) Hydrologic parameters for specific site materials such as the artificial fill.

2) Describe sampling and analysis procedures. For instance:

a) Method and equipment used to collect the samples. Collection and treatment procedures should follow EPA guidelines to minimize loss of volatiles and must be adequately described.

b) Sampling interval.

c) Number and type of soil samples. Discrete samples will be taken and analyzed.

d) Any proposed screening techniques 3.g. OVA.

3) An analysis plan for both soil and water should be presented.

a) Analysis must be based on EPA Method 8240 or 8010/8020 and supplemented by methods necessary to characterize other major chemicals pertinent to site use history.

b) Limits of detection should approach published EPA values. Laboratory QA/QC sheets must be submitted with the results in the technical report. The laboratory must be certified by DHS for the specific required procedures.

c) Description of laboratory extraction procedures and justification of detection limits achieved.

d) Water must be analyzed according to EPA Methods 601/601 or 624. Samples must be submitted to the laboratory in unfiltered form. Sample turbidity must be reported as well as any special laboratory preparation procedures. Any laboratory filtering must be described and justified with errors analysis. The same chemical suite as the soils must be analyzed for.

4. An approach to determining the retardation characteristics of the soils and artificial fill must be described.

5) Onsite contaminant and offsite disposal plans need to be described. For example, based on our walkthrough of December 30, 1986 the excavated contaminated soils which are not containerized should be protected from effects of rain and wind.

6) A site safety plan needs to be described and arrangements made relative to the excavation and other site investigation activities.

7) A description of systematic investigation of other possible onsite soil contamination needs to be made. Soil sampling must be performed in the AC area where evidence of barrel storage is present."

Additionally, the Regional Board staff made the following comments about the January 14, 1987, workplan mentioned earlier.

"1) The principal aquifer materials need to be characterized such as by sieve analysis and the filter pack designed on the basis of the results. The screen should be selected to match the filter pack. The results should be included in the technical report. Total solids in the sandfree non-turbid water to be produced should be less than 5ppm.

2) Screened casing should extend a minimum of 20 feet below water table and should extend 10 feet above water table. Elevations of the wellhead need to be determined.

3) A minimum of 3 feet of concrete or concrete-bentonite seal should be placed above the bentonite seal. The seal should be placed above the bentonite seal. The seal should be 3 to 5 feet in thickness.

4) The distribution of wells, with exception of MW-7, is chiefly along the buried channel. A well should be emplaced east of MW-2 along the property line to ascertain whether contaminated water is leaving the site along a broader front than anticipated. Shifting MW-9 would accomplish this.

5) Several shallow soil borings, from one to five feet in depth should be made in the AC area parking and samples analyzed prior to positioning of MW-6 and MW-5.

6) Determination of offsite extent of contamination should be addressed in this workplan, whether by sampling San Jose Creek or by obtaining permission for offsite drilling.

7) Consideration should be given to at least one well being extended deeper to determine vertical extent of contamination and possible involvement of a lower aquifer.

8) Site cross-sections should be developed from the data obtained in the borings. Hydraulic interconnectivity of the natural aquifer materials and artificial fill need to be determined. Consideration should be given to use of 2 inch piezometers.

9) Consideration should be given to aquifer testing to determine the efficacy of the ongoing pump/treat operation at MW-2 and whether or not any lateral permeability barriers exist. Geohydraulic parameters (velocity, gradient, direction, and transmissivity, etc.) should be developed from the data obtained."

A.4 Purpose of this Supplement

The purpose of this second supplement is two-fold. First, it is intended to serve as the addendum workplan requested on February 27, 1987. Secondly, it will report the results of all of our investigations and tests performed since the initial Supplement was submitted on 17 November 1986.

4.5 Actions Taken Since November 1986

In order to respond to questions posed by the Los Angeles Regional Water Quality Control Board in connection with the hydrogeologic features of the Puente Basin, the owner obtained professional advice from Robert C. Fox, Consulting Engineering Geologist. The results of Mr. Fox's work appear in Section B of this Second Supplement. His answers to the questions raised are based on data developed by the California Department of Water Resources and by Mr. Fox. In connection with the investigation of the Puente Basin, 66 logs of water wells were analyzed. These well logs are those that were readily available in Mr. Fox's files and which were collected during the course of studies performed for the Walnut Valley Water District in 1970. Additional logs of water wells, if they exist, are confidential and not available for use in this instance.

No field canvass was made of the wells and Mr. Fox, therefore, was not able to determine the present status of the wells, present water table elevation or basin-wide water quality. All other information regarding the water wells found on the Drillers' Logs are tabulated in Table 1 in Section B.

On January 30, 1987, the Los Angeles County Flood Control District issued Permit No. 87051-A to Ralph Wagner for access to the San Jose Creek Flood Control Channel subdrain system. The results and interpretation of this sampling program are contained in Section C of this report.

The owner of Monadnock Co. engaged the services of Brown and Caldwell to drill additional monitoring wells on the site in March 1987. Two wells (BC-1 and BC-2) were drilled along the easterly property line in the vicinity of MW-1, the primary purpose being to try to locate the old stream channel (now buried underground) to determine if any solvent contamination had migrated on-site from neighboring property.

Two additional wells were drilled on-site along the westerly property line in order to attempt to find the old buried stream channel as it leaves the site and better characterize the plume of contamination. A fifth, shallow boring was also made in a former drum storage area to determine if any drums had leaked in the past.

A discussion of the findings coming out of the Brown and Caldwell work appears in Section D., and their complete report is contained in Appendix B.

Sampling of all monitoring wells has also continued since the Supplement to the Site Evaluation and Proposed Remedial Action Plan was filed in November 1986. A recap and discussion of results is presented in Section E. All laboratory test result sheets are included in Appendix C.

Finally, a summary of all actions taken by the Monadnock Company to date is set forth in Section F, along with recommendations as to what further actions should be taken.

SECTION B
HYDROGEOLOGIC FEATURES

B.1 General

Puente Basin occupies San Jose Valley southwest of the narrows a few miles from the east end of the valley. The basin is horn-shaped with the large end opening into San Gabriel Basin. The locale includes a surface area of about 11,000 acres.

Structurally, Puente Basin is comparatively simple; there are no important barriers to the movement of ground water through the central part of the basin. Lying between the San Jose Hills on the north and the Puente Hills on the south, the basin joins Spadra Basin at its east end and San Gabriel Basin at its west end. An arbitrary line connecting the north ends of the hills on either side of Puente Basin separates it from San Gabriel Basin.

The floor of Puente basin is a canyon or narrow valley filled in its eastern part with alluvium to a depth of 100 to 200 feet. From a point about one mile southeast of Puente, it deepens from 200 feet to more than 500 feet within one and one-half miles towards San Gabriel Valley, and probably continues to deepen in that direction. The floor of the basin is somewhat irregular, and in the shallower part, several bedrock prominences protrude through the alluvium.

The alluvium of Puente Basin comes from two sources. In part it is composed of the materials derived locally from the bordering Puente and San Jose Hills. The alluvium along the flanks of the valley is entirely from this source. Through the central part of the valley, San Jose Creek has deposited gravels that were brought down from the San Gabriel Mountains by San Antonio Creek.

The alluvium along the flanks of the valley contain a large percentage of clayey material. This is probably due to its very gradual accumulation and to the ease with which the parent rock breaks down. During the recent history of San Jose Valley, San Antonio and San Dimas washes have not discharged into it, and consequently the clayey alluvium derived locally covers the entire valley. Beneath the surface, however, channels of gravel, originating largely from the crystalline rocks in the San Gabriels, are encountered. These gravels are comparatively clean and are good producers of ground water.

In spite of the presence of the water-bearing gravels, the average percent of clayey material is high. Well logs over the entire basin show an average of about 65 percent clayey material, 5 percent sand, and 30 percent gravel.

Groundwater in Puente Basin is supplied principally from two sources: (1) rainfall infiltration on the valley floor and percolation of run-off from the adjacent watershed; and (2) underflow from San Jose Basin. The principal movement of ground water is

westerly and follows the old gravel channels of San Jose Creek through the central part of the valley and through the narrow eastern part of the basin. As the basin widens and deepens toward the west, the water table flattens and diverges from the bedrock.

Through the central part of the basin, the water table (piezometric surface) is generally within 20 to 30 feet of the surface, and in wet years rises sufficiently to appear in places in the streambed. Lining of the wash has precluded rising ground water from entering the present low-flow channel of the creek, (except in the channel underdrain system) but water does rise close to the surface in non-paved areas of the basin, where overlying clay strata are very thin, or absent. Fluctuations of the water table in Puente Basin are relatively small, with an average fluctuation of less than 10 feet.

An idealized geologic cross section through Puente Basin prepared by Mr. Fox is shown schematically in Figure 1. Much of this information was derived by Mr. Fox's analysis of 66 logs of water wells as summarized in Table 1. The average depth of these wells is 125 feet, and their average interval of perforations is 45 to 103 feet. This average data appears to confirm Mr. Fox's idealized cross section of the confined aquifer in the Puente Basin.

The Monadnock site is located in Section 14; the Ajax site is in Section 15; and the BDP site is in Sections 9 and 16. Of the 66 wells catalogued by Mr. Fox, half of them are located in Sections 9, 10, 13, 14, 15, and 16, generally surrounding or in close proximity to the three sites where PCE/TCE contamination of soil and ground water has been detected. The average depth of these 33 wells is 112 feet, and their average interval of perforations is 47 to 101 feet, again confirming Mr. Fox's idealized cross section.

B.2 Ground Water Gradient, Velocity, Transmissivity, Permeability.

During the course of his study for Walnut Valley Water District, in 1970, Mr. Fox found that the average hydraulic gradient of the water table in the basin was approximately 50 feet per mile or 0.0093 ft/ft. to the west.

During the aforementioned investigation, aquifer tests were performed near the northwest corner of Water Street and the Pomona Freeway. The purpose of these tests was to determine the aquifer constants of Transmissivity and Permeability. Wells used for the test were located in Section 13, Township 2 South, Range 10 West, as shown on Plate 1. For perspective, the Monadnock, Ajax, and BDP sites have been superimposed on this Plate.

The drawdown effects of pumping well 2S/10W-13J2 were measured at observation well 2S/10W-13J1. The distance between these wells is 253 feet. Drawdown measurements were obtained at well - 13J1. These measurements were plotted against time on log-log graph paper. Recovery water-level measurements were obtained at well

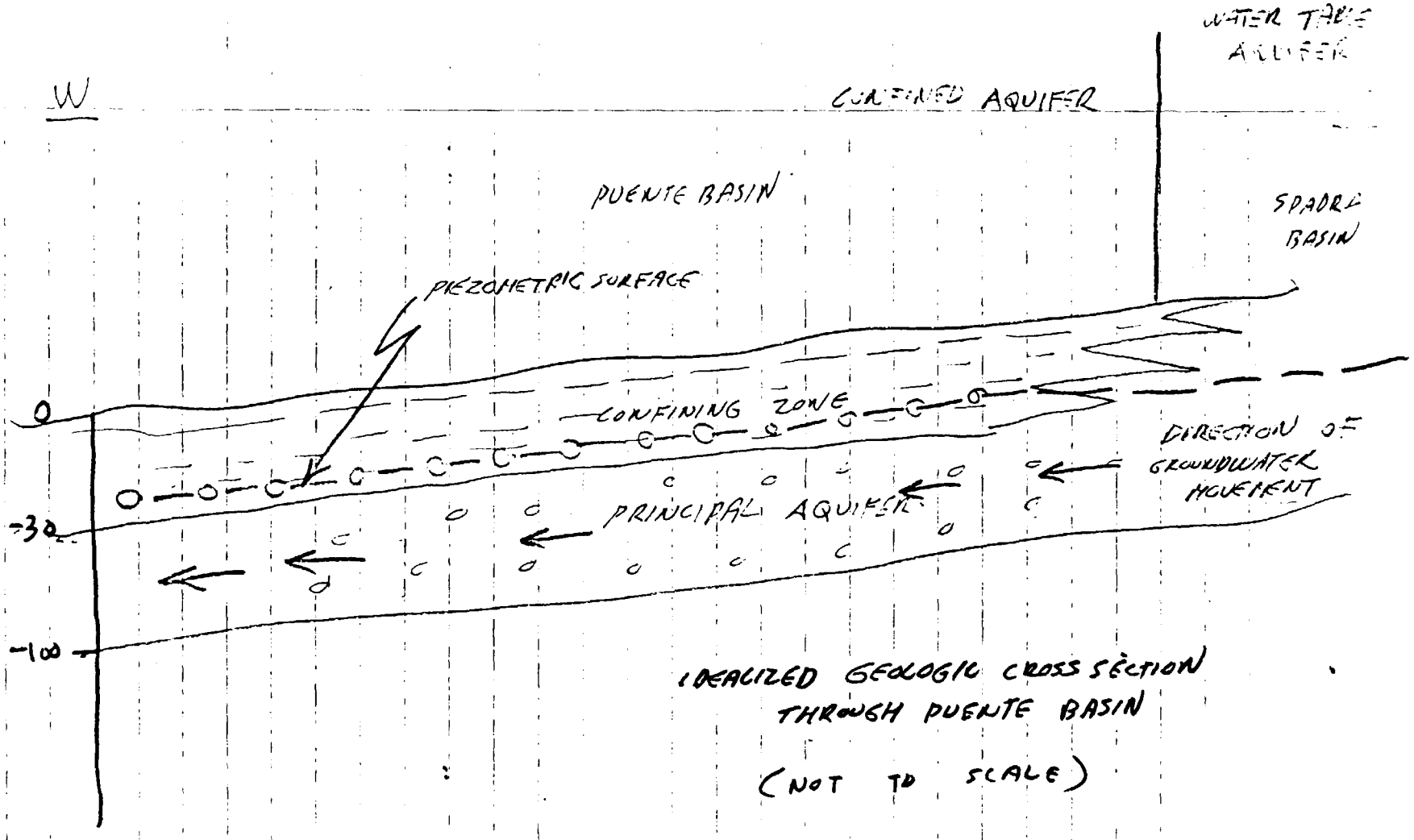

W
CONFINED AQUIFER
WATER TABLE AQUIFER
PUENTE BASIN
SPADRA BASIN
PIEZOMETRIC SURFACE
0
CONFINING ZONE
DIRECTION OF GROUNDWATER MOVEMENT
-30
PRINCIPAL AQUIFER
-100
IDEALIZED GEOLOGIC CROSS SECTION THROUGH PUENTE BASIN
(NOT TO SCALE)

FIGURE 1

TABLE 1
WATER WELLS WITH DRILLERS' LOGS
IN PUENTE BASIN

WELL NO.	OWNER	DATE DRILLED	DRILLER	DEPTH	DIA:	METHOD	DISCHARGE	DRAWDOWN	PERF.INT.	SAN.SEAL	USE
25/9W-7K1	EE Buck	3-55	Hardcastle	78'	12" to 40' 8" to 78'	CABLE	-	-	32'-74'	NO	DOM.
25/9W-18A1	St. Clair	1930	Wilkerson	104'	14"		-	-		?	-
25/9W-18E3	Walnut V. Golf Club	7-64	McCalla	150'	12 3/4"	Rotary	180 GPM	128ft.	21'-41' 130'-138' 81'-90' 140'-150'	?	IRR
25/9W-703	Roy Cobb	11-54	Hardcastle	76'	8"	Cable	-	-	68'-41'	NO	DOM & IRR
25/9W-18D1	Roland Mutual Water Co	8-52	Hardcastle	67'	12"	Cable	-	-	22'-62'	NO	IRR
25/9W-18D3	B.Hicks	-	Wilkerson	65'	-	-	-	-	-	-	-
25/9W-18D4	W.Alvarado	-	Wilkerson	84'	12"	-	-	-	-	-	-
25/9W-18E1	A.Chavez	7-51	Hardcastle	80'	10"	Cable	-	-	30'-78'	NO	IRR
25/9W-18E2	A.Chavez	12-48	-	57'	10"	-	-	-	-	-	-
25/9W18F1	H.Boezinger	5-52	Hardcastle	96'	14"	Cable	-	-	28'-85'	NO	IRR
25/9W18G1	General Concrete Products	7-56	Hardcastle	88'	10"	Cable	-	-	30'-78'	NO	IND
25/9W18H1	F.Caufman	4-61	Hardcastle	76'	8"	Cable	-	-	-	-	DOM
25/10W-13A2	Wheeler	8-55	Water Well Sup	75'	8 5/8"	Cable/Rot?	-	-	10'-75'	?	-
25/10W-13C1	Barnaby	6-51	Hardcastle	72'	8"	Cable + Gravel	-	-	36'-71'	-	IRR

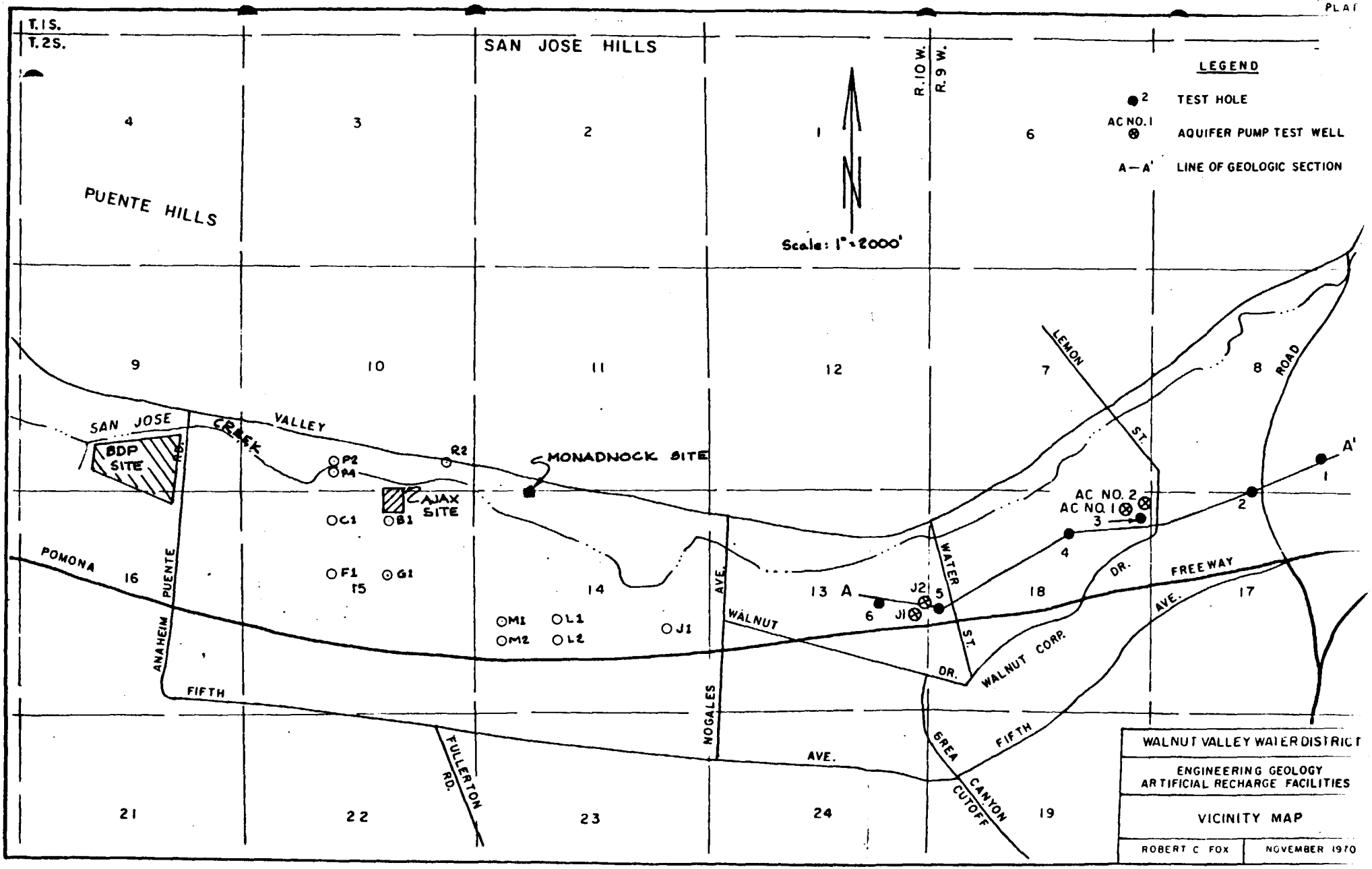
WELL NO.	OWNER	DATE DRILLED	DRILLER	DEPTH	DIA:	METHOD	DISCHARGE	DRAWDOWN	PERF.INT.	SAN.SEAL	USE
25/10W-14M1	Grazide WaterCo	4-51	Hardcastle	131'	10"	Cable	-	-	60'-118'	NO	IRR
25/10W-14M2	Grazide	11-42	Saunders	140'	18"	-	-	-	-	-	-
25/10W-6A1	Raynolds	8-20	Metcalf	85'	7"	-	-	-	70'-80'	-	-
25/10W-6B2	Smith	9-20	Metcalf	53'	7"	-	-	-	-	-	-
25/10W-6G1	Pattison	5-28	Metcalf	166'	8"	-	-	-	26'-32' 150'-154' 71'-75'	-	-
25/10W-6H1	Loustalot	1920	Metcalf	131'	7"	-	-	-	51'-60'	-	-
25/10W-6H2	Glaven	7-25	Metcalf	54'	7"	-	-	-	-	-	-
25/10W-6J1	LA Puente Walnut Grwrs	8-24	Metcalf	84'	7"	-	-	-	41'-56'	-	-
25/10W-6P4	Glaven	1-27	Saunders	96'	12"	-	-	-	0'-96'	-	-
25/10W-7A1	Golden State School	1918	Metcalf	159'	-	-	-	-	-	-	-
25/10W-7C1	San Gabriel Valley	11-50	Saunders	272'	16"	Cable	740 GPM	10'	27'-255'	NO	DOM & IRR
25/10W-8E1	Victoria Mutual Water	5-30	Saunders	500'	16"&12"	-	-	-	-	-	-
25/10W-8E2	Victoria Water	10-17	Saunders	260'	16"	-	-	-	102'-108' 156'-184' 151'-153'	-	-
25/10W-8E3	Victoria Water	9-53	Moss	280'	16"	Cable	490 GPM	68'	155'-190'	-	-

WELL NO.	OWNER	DATE DRILLED	DRILLER	DEPTH	DIA:	METHOD	DISCHARGE	DRAWDOWN	PERF.INT.	SAN.SEAL	USE
25/10W-13D3	Stamy	12-58	Saunders	108'	12"	Cable	183GPH	37ft.	30'-42' 48'-100' 42'-48'	-	IRR
25/10W-13D4	Pettifield	1925	Wilkerson	95'	10"	-	-	-	-	-	-
25/10W-13G1	Bourdett	3-51	Hardcastle	60'	-	-	-	-	27'-40'	NO	IRR
25/10W-13G2	Bourdel	11-52	Hardcastle	60'	12"	Cable	-	-	31'-53'	NO	IRR
25/10W-13H2	Chavez	6-51	Hardcastle	53'	10"	Cable	-	-	25'-43'	NO	IRR
25/10W-13H3	Myers	7-51	Hardcastle	60'	8"	Cable	-	-	44'-53'	NO	I[illegible]
25/10W-13J1	Banks	3-51	Hardcastle	76'	8"	Cable	-	-	41'-75'	NO	-
25/10W-13J1	Valencia WaterCo	8-51	Hardcastle	86'	12"	Cable	-	-	36'-82'	NO	IRR
25/10W-13J3	Sanders	8-51	Hardcastle	64'	10"	Cable	-	-	34'-62'	NO	IRR
25/10W-13J2	Milliken Irisgardens	11-59	Hardcastle	92'	10"	Cable	-	-	31'-90'	NO	DOM & IRR
25/10W-13R1	Banks	3-51	Hardcastle	72'	10 3/4"	Cable	-	-	27'-64'	NO	IRR
25/10W-13Q1	Grant	11-54	Hardcastle	100'	10"	Cable	-	-	24'-100'	NO	DOM & IRR
25/10W-13R2	Myers	9-52	Hardcastle	106'	8"	-	-	-	30'-80'	NO	I[illegible]
25/10W-14J1	Rowland	1928	Wilkerson	96'	12"	-	-	-	-	-	-
25/10W-14L1	Bennett	11-50	Hardcastle	134'	10"	Cable	-	-	80'-105'	NO	IRR
25/10W-14L2	Lover	11-41	Hardcastle	172'	-	Cable	-	-	40'-122'	NO	IRR

WELL NO.	OWNER	DATE DRILLED	DRILLER	DEPTH	DIA:	METHOD	DISCHARGE	DRAWDOWN	PERF.INT.	SAN.SEAL	USE
25/10W-8G1	Ferrero	7-26	Saunders	231'	16"	-	-	-	-	-	-
25/10W-8H1	Rubinson	-	-	170'	12"	-	-	-	39'-45' 102'-105' 82'-86' 130'-162'	-	-
25/10W-8L1	Lowery/ Sanchez	-	-	436'	14"	-	-	-	? ?	-	-
25/10W-8P1	Ferrero	10-26	Saunders	207'	14"	-	-	-	-	-	-
25/10W-9K1	Didier	12-53	Hardcastle	117'	10"	Cable	-	-	67'-117'	NO	DOM & IF
25/10W-9Q3	Rowland	1932	Wilkerson	112'	12"	-	-	-	-	-	-
25/10W-9Q4	Rowland	-	Wilkerson	73'	-	-	-	-	-	-	-
25/10W-9Q5	Rowland	-	Wilkerson	92'	-	-	-	-	-	-	-
25/10W-9R1	Utility Trailer Mfg.Co.	5-56	Hardcastle	132'	10"	Cable	-	-	92'-96' 112'-116'	-	IND
25/10W-10P2	Western Cattle	6-50	Hardcastle	140'	12"	Cable	-	-	34'-45' 38'-80'-100' 150'	NO	IRR
25/10W-10P4	Altadena Dairy	11-58	Mogle	300'	12"	Rotary	750 GPM	60'	60'-300'	?	IRR
25/10W-10R2	Tetley	6-35	Wilkerson	201'	12"	-	-	-	-	-	-
25/10W-15B1	Todd	7-54	Hardcastle	122'	10"	Cable	72 GPM	-112'	60'-115'	NO	DOM &IRR
25/10W-15C1	Rowland	1928	Wilkerson	106'	12"	-	-	-	-	-	-

WELL NO.	OWNER	DATE DRILLED	DRILLER	DEPTH	DIA:	METHOD	DISCHARGE	DRAWDOWN	PERF.INT.	SAN.SEAL	USE
25/10W-15F1	Angelo	1929	Wilkerson	100'	7"	-	-		-	-	-
25/10W-15G1	Lawson	11-50	Lawson	107'	12"-14"18"	Cable	396 GPM	15'	48'-107'	NO	IRR
25/10W-16B1	Mathis	2-51	Hardcastle	125'	8"	Cable	-	-	97'-117'	-	&IRR
25/10W-16B2	Union Pac	-	Wilkerson	89'	7"	-	-	-	-	-	-
25/10W-16G1	Parriott	6-52	Hardcastle	170'	8"	Cable	-	-	64'-126'	NO	IRR
25/10W-17D1	Cross	-	Metcalf	155'	-	Cable	-	-	35'-47'	-	-
25/10W-18D3	Hicks	-	Wilkerson	65'	-	-	-	-	-	-	-
25/10W-18L1	Yates	8-56	Hardcastle	104'	10"	Cable	-	-	61'-65' 84'-87'	NO	DOM &IRR

KEY: DOM = Domestic; IRR = Irrigation; IND = Industry



WALNUT VALLEY WATER DISTRICT

ENGINEERING GEOLOGY
ARTIFICIAL RECHARGE FACILITIES

VICINITY MAP

ROBERT C FOX | NOVEMBER 1970

13J2 after pumping ceased. These measurements were plotted against t/t' on semi-log graph paper.

The Albert Carry Wells, A.C. No. 1 and A.C. No. 2 were also tested. These wells are located in Section 18, Township 2 South, Range 9 West, and are near Lemon Road and the Union Pacific Railroad. The hydrogeologic data indicated that - 13J2, - 13J1, A.C. No. 1 and A.C. No. 2 represent confined aquifer conditions.

Field test results were matched with the nonleaky artesian-type curve to calculate the coefficients of Transmissivity, Permeability and Storage. Results of this effort indicate that "T" varies from 110,000 to 393,000 gpd/ft and permeability (K) varies from 2,390 to 8550 gpd/ft^2.

During the 1970 investigation, no data were presented regarding the rate of ground water movement. However, using a value for "K" of 4,000 gpd/ft^2, which is considered reasonable in light of the field tests that were performed, velocity may be computed by Darcy's equation:

$$V = \frac{K \times s}{7.48}$$

where: V = ground water velocity
K = Permeability
s = hydraulic gradient

$$V = \frac{4{,}000 \times 0.0093}{7.48}$$

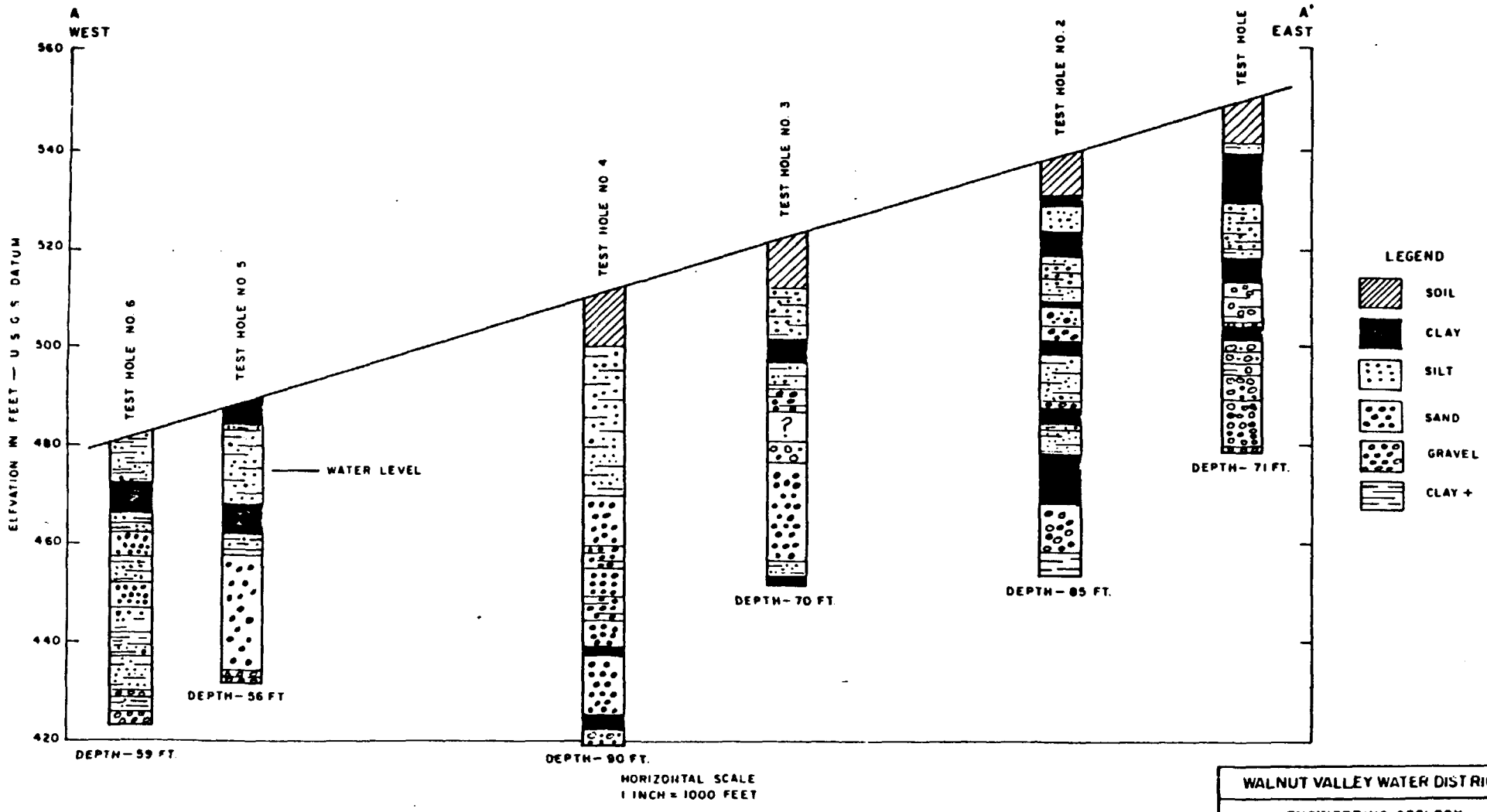
$$= 4.8 \text{ feet/day}$$

The investigation for Walnut Valley Water District was undertaken to determine the feasibility of utilizing portions of the basin for artificial recharge purposes. In connection with that effort, and in addition to the work presented above, exploratory drill holes were constructed in selected areas of the basin. Six sites were designated for drilling. Depth of the test holes varied from 56 to 85 feet. A cross-section through the five test holes is shown on Plate 2.

Results of test hole drilling confirmed the existence of an ancient river channel and that the subsurface materials comprised a heterogeneous mixture of clay, silt, sand, gravel and cobbles. Clay and silty clay predominated in all test holes below the soil mantle to the top of a coarser member which was situated between depths of 30 and 40 feet below ground surface. The deeper, coarser member of the alluvium was considered to be confined by the rather thick silt-clay and clay stratum which capped the lower member. The confining nature of the alluvial sediments was verified by the aquifer tests performed, which were described previously.

In addition to the earlier work done by Fox, Dames & Moore made an estimate of ground water hydraulic gradient, and Emcon evaluated transmissivity and permeability at the Ajax site.

PLATE -



WALNUT VALLEY WATER DISTRICT	
ENGINEERING GEOLOGY ARTIFICIAL RECHARGE FACILITIES	
GEOLOGIC SECTION A–A'	
ROBERT C. FOX	NOVEMBER 1970

A comparision of this data is shown in Table 2. The results show little, if any consistency or uniformity other than with respect to hydraulic gradient. At the Ajax site, Emcon took six soil samples to obtain proosity and permeability values for possible use in groundwater movement and pollutant fate modeling. The laboratory results are shown below in their Table 13. The results indicate that the soils are highly permeable particularly in the horizontal direction. In addition, the results indicate that the porosity ranges from 15.8% for a gravel sample to 45.3% for a clayey sample. At the BDP site, Kennedy/Jenks/Chilton estimated porosity to range from 0.33 to 0.42.

TABLE 13
POROSITY AND PERMEABILITY
(Ajax Site)

Sample No (Depth, Ft.)	Soil Classi-ification (USGS)	Horizontal Porosity (Percent)	Horizontal Permeability (cm/second)	Vertical Permeability (cm/second)
B-26				
9.5 - 10.0	SM	35.6%	>1.06 x 10-^{2}	1.14 x 10^{-3}
24.5 - 25.0	GW	28.9%	>1.06 x 10-^{2}	1.08 x 10^{-2}
34.0 - 34.5	GW	15.8%	>1.06 x 10-^{2}	1.59 x 10^{-3}
B-27				
9.5 - 10.0	CL	39.1%	>1.06 x 10-^{2}	1.79 x 10^{-3}
29.5 - 30.0	GW	20.6%	>1.06 x 10-^{2}	6.40 x 10^{-3}
44.5 - 45.0	CL	45.3%	>1.06 x 10-^{2}	7.27 x 10^{-3}

B.3 Possible Upgradient Sources of Contamination

During the course of the present study, efforts have been made to determine the source of ground water degradation. A problem that manifested itself immediately is the fact that the principal aquifer is confined and the piezometric surface, in general, is higher than the interface between the clay aquiclude and the aquifer. Because of the condition of positive "head" on the principal aquifer, downward migration of surface discharges into the confined aquifer is unlikely except through gravel packed wells. However, most of the wells drilled in Puente Basin are cable-tool

TABLE 2
COMPARISON OF AVAILABLE HYDROGEOLOGIC PARAMETERS

Source	Area	Hydraulic Gradient (ft/ft)	Transmissivity (gpd/ft)	Permeability gpd/ft^2	Velocity
Robert C. Fox	Puente Valley	0.0093	110,000-393,000	2390-8550	4.8'/day*
Dames & Moore	Monadnock Site	0.0007	-	-	1'-30-'/ye
Emcon	Ajax Site	-	7,900-15,000	>1.06x10^{2}cm/sec = >225 gpd/ft^2	-
Kennedy/Jenks/ Chilton	BDP Site	0.003-0.006	-	-	4'-10'/day*
Corp of Engineers	San Jose Creek Channel - Nogales St. to Anaheim - Puente Rd.	0.008	-	-	-

* Values for confined aquifer, not for unsaturated zone above the aquaclude

drilled. This would apparently preclude wells as a source of ground water movement from surface discharges into the main aquifer unit. As a matter of fact, of the 66 wells with Driller's logs, only two are known to be rotary-drilled and gravel packed.

Ground water velocity computations described previously indicate that water is moving through the aquifer at a rate of about 5 feet per day or approximately 1800 feet per year. At this rate of movement, ground water moves one mile in less than three years. It is within the realm of possibility that contaminants from as far away as four miles could reach a downstream position in about 10 or 11 years.

Likely sources of ground water quality degradation include, but are not limited to, waste discharges from industrial complexes located near the boundary of Puente Basin and Spadra Basin. Such a locality is suggested because the confining aquiclude does not exist in this vicinity and direct hydraulic continuity between the ground surface and the underlying aquifer system is available.

A second source of probable water quality degradation is the Spadra Landfill which has operated in the upstream portion of the study area for a number of years. Although not approved as a Class 1 site, it is possible, and quite probable, that liquid wastes have been mixed with refuse prior to transport to the landfill.

In Figure 2, all of the easily identified and relatively large upgradient sources of possible contamination are shown. In Table 3, they are identified, characterized, and their approximate distance from the Monadnock site is indicated.

UPGRADIENT SOURCES
OF POSSIBLE
CONTAMINATION

9. Site Assessment Evaluation and Proposed Remedial Action Plan. –

10. 1ST Supplement

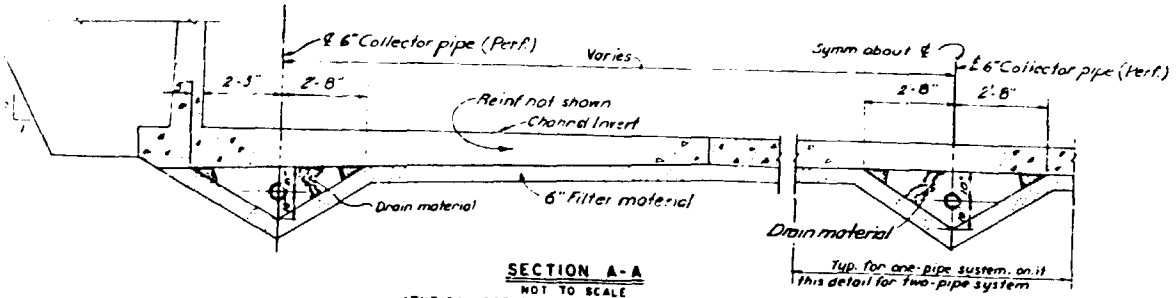
11. 2ND Supplement (

→ 12.

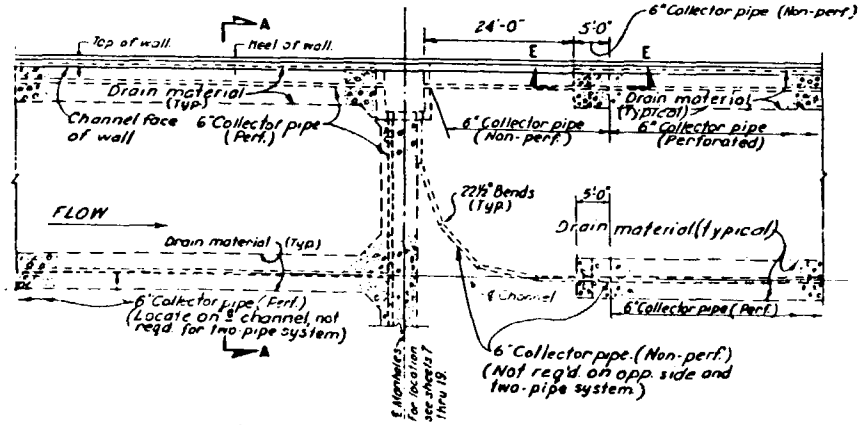
13. ~~Deep Monitor~~ Plan Drilling of Deep Monitor Well (Specimen etc)
- 30 OCT 1987 – revise date
- 22 Sept 1987 – date / sampling specs.
- 17 Sept 1987 – + RWQE – review & proposed work plan
- [illegible] Sept 1987 – 1ST review date / plan
- 4 Sept – deep / monit. / [illegible] SDP – 1ST

TABLE 3
POSSIBLE UPGRADIENT SAOURCES OF CONTAMINATION
(See Figure 2 for Locations)

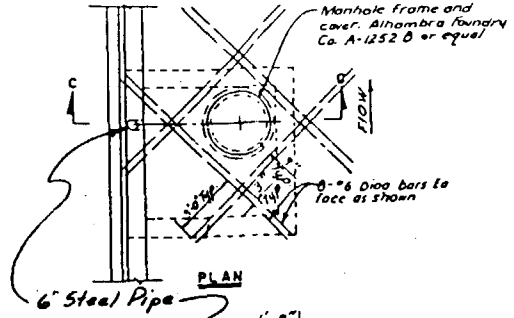
erence per	Identidication	Type Business	Approximate Distance Upgradient from Monadnock
	Spadra Landfill	Sanitary Landfill	32300 ft. (6.1 mi)
	Ti-Tech	Electronics (?) Metal Cleaning	30300 ft. (5.7 mi)
	Teledyne	Machinery, Castings Metal Cleaning	29300 ft. (5.5 mi)
	Feed Yard	Animal Feeding	25200 ft. (4.8 mi)
	Libby Glass	Glass Products	22600 ft. (4.3 mi)
	Atlas Van	Maintenance, Repair of Moving Vans, Possible Solvents	12100 ft. (2.3 mi)
	Norris Industries	Plumbing, Forgings Machinery, Metal Cleaning	11100 ft. (2.1 mi)
	Plastron and Golden State Food	Plastic Medical Tubing McDonald's Supplier	8400 ft. (1.6 mi)
	S. K. Products and So What of Calif	Wood Furniture, Resins Paints, Thinners Clothing Manufacture	7100 ft. (1.3 mi)
	Dart Trucking	Warehouse	5700 ft.
	Breuner Furniture (former	Furniture Rental General Tire Manufacturing)	4400 ft.
	General Tire	Distribution Center	3400 ft.
	Lithonia	Fluorescent Lighting Stampings, Metal Cleaning (Former Turn Steel, steel stamping, metal cleaning)	600 ft.
	Monadnock	Aerospace and Aircraft Fasteners	0



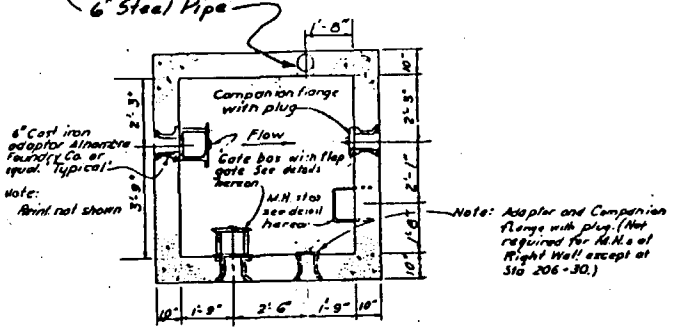
SECTION A-A
NOT TO SCALE
(TYPICAL FOR TWO & THREE-PIPE SYSTEM)



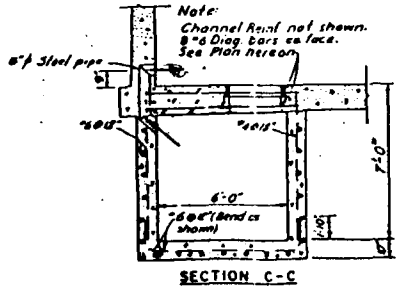
HALF PLAN
NOT TO SCALE
(TYPICAL FOR TWO & THREE-PIPE SYSTEM)



PLAN



MANHOLE DETAIL
NOT TO SCALE



SECTION C-C

MANHOLE REINFORCING DETAILS
NOT TO SCALE

AS-BUILT CHANNEL UNDERDRAIN DETAILS

Figure 3

C.2 Subdrain Sampling Program

On 10 February 1987, Ralph Wagner collected water samples at selected locations from the subdrain system of San Jose Creek Flood Control Channel. This was done under Permit No. 87051-A issued on 1-30-87 by Los Angeles County Flood Control District.

As previously indicated the subdrain system consists of a network of 6" dia. perforated pipes beneath the bottom slab on each side of the channel. At intervals of 500 feet on each side of the channel, there is manhole access to the subdrain system. The manhole covers are sealed and bolted down. However, at each access manhole there is a 6" dia. pressure relief line from beneath the cover, up through the side wall, discharging back into the channel about 9" above the bottom slab. When the subdrain system fills any of the manholes, pressure is controlled by the discharge of subdrain water through the relief line. It is the discharge of subdrain water through these relief lines which was sampled, wherever they were running.

Manhole covers were not removed primarily because most were covered with water flowing in the channel, and to do so would have allowed surface water to possibly contaminate subdrain water. By taking samples from the relief lines discharging above the flow of water in the channel, no contamination occurred.

Samples were taken by Ralph Wagner at the following stations, beginning downstream from the Ajax facility and working upstream to Nogales St. The Monadnock site is between Stations 423+00 and 427+00. The Ajax site extends from about Station 380+00 to 394+00. Analytical results for PCE, TCE, and TCA are indicated at each sampling point. (N) indicates north side of channel; (S), south side. Monadnock is on the north side of the channel; Ajax is on the south side.

Sampling Station	PCE	TCE	TCA
375+00 (S)	40 ppb	110 ppb	10 ppb
375+00 (N)	170 ppb	20 ppb	<10 ppb
430+00 (N)	<5 ppb	<10 ppb	<10 ppb
430+00 (surface flow)	<5 ppb	<10 ppb	<10 ppb
435+00 (S)	<5 ppb	<10 ppb	<10 ppb
435+00 (N)	<5 ppb	<10 ppb	<10 ppb
440+00 (S)	13 ppb	13 ppb	<10 ppb
440+00 (N)	<5 ppb	<10 ppb	<10 ppb
450+00 (N)	<5 ppb	<10 ppb	<10 ppb
465+00 (N)	<5 ppb	<10 ppb	<10 ppb
470+00 (N)	<5 ppb	<10 ppb	<10 ppb

All samples were tested by AnaCon Labs, 713 North Main St., Riverside, CA 92501, using EPA Method No. 601. The laboratory

test result sheets as well as AnaCon's QA/QC sheets are included in Appendix A.

All of this data is displayed on the accompanying composite drawing, figure 4, showing the following information.

1. The alignment and stationing of the San Jose Creek Flood Control Channel from Nogales St. westerly to the point where The Fullerton Channel joins it.

2. The locations of the Monadnock property and the Ajax property.

3. The course of San Jose Creek (before it was channelized) in relation to the improved channel.

4. The points at which samples of water were taken from the subdrain system on 2-10-87, and the results of the analyses for PCE, TCE and TCA.

5. Logs of soil borings made in 1961-1964 along the route of San Jose Creek Channel before it was built.

Initial interpretation of this data is as follows:

1. Upgradient from the Monadnock site, on the north side of the channel, background (natural) levels for constituents of concern appear to be as follows:

Constituent	Background (ppb)	Comment
PCE	< 5 ppb	DOHS Action Level (AL) is 4 ppb
TCE	<10 ppb	DOHS AL is 5 ppb
TCA	<10 ppb	DOHS AL is 200 ppb

2. Downgradient from the Ajax site, the concentrations of PCE/TCE appear to be at least 25 to 10 times DOHS Action Levels, respectively.

3. It was not possible to obtain any samples on 2-10-87 from the channel subdrain system between Monadnock and Ajax because none of the relief lines were flowing. Consequently, no judgment can be made as to concentrations of these parameters between the two facilities.

It was hoped that some of the relief lines in the subdrain system would start to flow in March or April 1987. However this was not the case. On 24 March 1987, for instance, we re-entered the channel in hope of finding additional relief lines flowing. Since this was not the case, we simply obtained a sample of surface flow from the double box inlet entering the main channel at Station

405+00. No PCE, TCE or TCA were detected; however, field pH was 6.2, TDS was 1440 mg/L, and EC was 1610 umhos/cm.

We would still like to obtain samples from the subdrain system in the channel between the Monadnock and Ajax sites. This will involve the removal of bolted down manhole covers in order to gain access for sampling. Pursuant to the conditions of Permit No. 8751-A, the test results of all samples have been furnished to the Flood Control District. One of their representatives has also agreed that we may unbolt manhole covers downstream from Monadnock and upstream from Ajax once the channel flows diminish a bit more this summer in order to try to obtain samples between the two facilities. If surface flows are still present, we will build temporary sandbag dikes around the manholes to prevent contamination (or dilution) by surface flows in the channel.

In conjunction with the monitoring work done in the past at the BDP site, Kennedy/Jenks/Chilton observed that "Water levels measured in monitoring wells near SJC and flows observed issuing from the subdrainage system discharge pipes indicate that some of the unconfined groundwater in the vicinity of BDP Company may be discharged to SJC." They went on to say that "There is preliminary evidence of the presence of volatile organic compounds (VOC's) in water being discharged from the channel subdrainage system into SJC surface flows. A grab water sample was collected from the south channel wall subdrainage discharge pipe at Station 311+00 (corresponding to laboratory sample ID 5423-SJ-1) on 4 April 1986. Laboratory results, shown in Attachment A, indicate the presence of PCE, TCE and TCA at similar concentrations to those detected in groundwater monitoring wells MW-15 and MW-16." The results are summarized below.

REPORT OF ANALYTICAL RESULTS
BDP SITE

LOG NO	SAMPLE DESCRIPTION, WATER SAMPLES
04-090-2	5423-MW15-1G (MW-15)
04-090-3	5423-MW16-1G (MW-16)
04-090-4	5423-SJ-1 (SAN JOSE CREEK CHANNEL UNDERDRAIN) (Sta. 311+00)

PARAMETER	04-090-2	04-090-3	04-090-4
EPA Method 601			
Date Extracted	04-07-86	04-07-86	04-07-86
1,1 - Dichloroethene, ug/L	-	<1	<1
Tetrachloroethene, ug/L	6500	1500	3000
1,1,1-Trichloroethane, ug/L	-	7	51
Trichloroethylene, ug/L	810	230	1000

Kennedy/Jenks/Chilton also collected five samples of surface water flow in San Jose Creek Channel on April 29, 1986. Laboratory results indicate the presence of PCE and TCE in concentrations of

less than 13 ppb in the stream channel flow at all locations sampled. A sample upstream and upgradient of the groundwater flow of the BDP Company site, shows approximately the same concentration as the surface flow in SJC downstream of the subdrain discharge pipe at Station 311+00.

The fact that surface flows in San Jose Creek Channel do not appear to be contaminated is also verified by our own sampling of SJC upstream from Monadnock (Sta. 430+00), where PCE < 5 ppb, TCE < 10 ppb, and TCA < 10 ppb.

C.3 San Jose Creek Channel Soil Borings

The logs of 11 soil borings along the route of San Jose Creek Channel taken by the Corps of Engineers in 1961-1964 are shown in Figure 4, along with their locations.

None of the soil borings were drilled to a depth in excess of 50 feet; most were 35 feet or less.

Two 50' deep borings, No. 56 and 57, encountered soft, silty shale classed as bedrock at a depth from 18' - 22.5'. These borings are both in a location remote from the natural course of San Jose Creek, and would perhaps explain the meander of the creek around the formation.

Ground surface elevations of the borings range from a high point of elevation 455' to a low point of 370'. At the time of borings, ground water varied in elevation from 429' to 361' over a horizontal distance of about 8500 feet. The ground water gradient, therefore, was about 0.008 feet/foot.

There is a great deal of information shown in the logs of these soil borings, in addition to soil classifications, which are useful in envisioning the stratigraphy of the area. Of particular interest are the moisture content (MC), the percent of material passing No. 4 sieve (#4), the percent of fine material passing No. 200 sieve (#200), and the number of blows of a 140# hammer to drive a penetrometer one foot (N). On the basis of this data, it would appear that the ground water detected by the Corps of Engineers was in an upper aquifer underlain by layers of dense, fine-grained material at depths ranging from 20' - 30'.

Some of the deeper 50' borings obviously penetrated into, but more than likely not completely through the confining layer identified by Fox. In general, the soils above the confining layer appear to consist of fine grained inorganic silts with low to medium compressibility, and inorganic clays with low to medium plasticity. Neither the silts nor clays appear to contain any significant amount of organic material. The values of blow counts, N, indicate that the confining layer is dense, while material above it is erratic in density, ranging from loose to fairly dense. In general, these same soil properties are exhibited in the borings on the Monadnock site, thus confirming the presence of the confining layer approximately 30' - 40' below

ground surface with erratically deposited lenses of fine to coarse grained materials above it.

SECTION D
BROWN & CALDWELL BORING PROGRAM

D.1 Purpose

The investigation performed by Brown & Caldwell was conducted on 24 March 1987 upon authorization by Charles M. Miller, President, the Monadnock Company. Its purpose was to attempt to determine if any solvent constituents had migrated on-site from any neighboring property to the east and further define the distribution of solvent constituents in the soil and groundwater along the western property line. In addition, the investigation included determining if soil was contaminated beneath pavement in a former drum storage area.

D.2 Fieldwork

Brown & Caldwell installed three groundwater monitoring wells, BC-2 (MW-4), BC-3 (MW-8), and BC-5 (MW-7). Note that there is no MW-5 or MW-6 at this time. The three monitoring wells drilled earlier (July 1986) on the site are MW-1, MW-2 and MW-3. Brown & Caldwell also drilled two soil borings, BC-1 and BC-4. The location of these wells and borings are shown on Figure 1 of the Brown & Caldwell report which is reproduced in its entirety in Appendix B. Of the two soil borings, BC-1 was drilled to a total depth of 40 feet and BC-4 was drilled to 21.5 feet. Soil samples were collected at five foot intervals from both borings. The purpose of BC-1 was to attempt to locate the now-buried course of an old tributary to San Jose Creek, which tributary is indicated on old aerial photographs to have meandered through the present Monadnock site. (See Figure 5). It was concluded in the field at the time of boring BC-1 that the materials encountered did not represent unconsolidated backfill as might reasonably be found if the boring had penetrated the filled-in zone of the old stream channel. No ground water was encountered. Consequently, boring BC-1 was filled with concrete.

The purpose of boring BC-4 was simply to penetrate the pavement in an old drum storage area where footprints of the drums were evident in the asphalt pavement. Soil samples were taken at depths of 5', 10', 15' and 20', and a composite was analyzed for purgeable priority pollutants using EPA Test Method 8240. Results from the analysis for the boring BC-4 sample indicate concentrations below detectable limits in all priority pollutant constituents. This boring was also filled with concrete.

Three groundwater monitoring wells were installed using a truck-mounted drill rig equipped with continuous flight hollow-stem augers. One well, BC-2 (MW-4) was drilled along the easterly property line approximately 59 feet southerly from MW-1. On the basis of the soils encountered, the engineering geologist for Brown & Caldwell felt that the boring had penetrated the old, now-buried, stream channel. The total depth of this boring was 62 feet, and water was encountered at about 39 feet. The log of this boring (BC-2) indicates that the confining layer of brown clay was

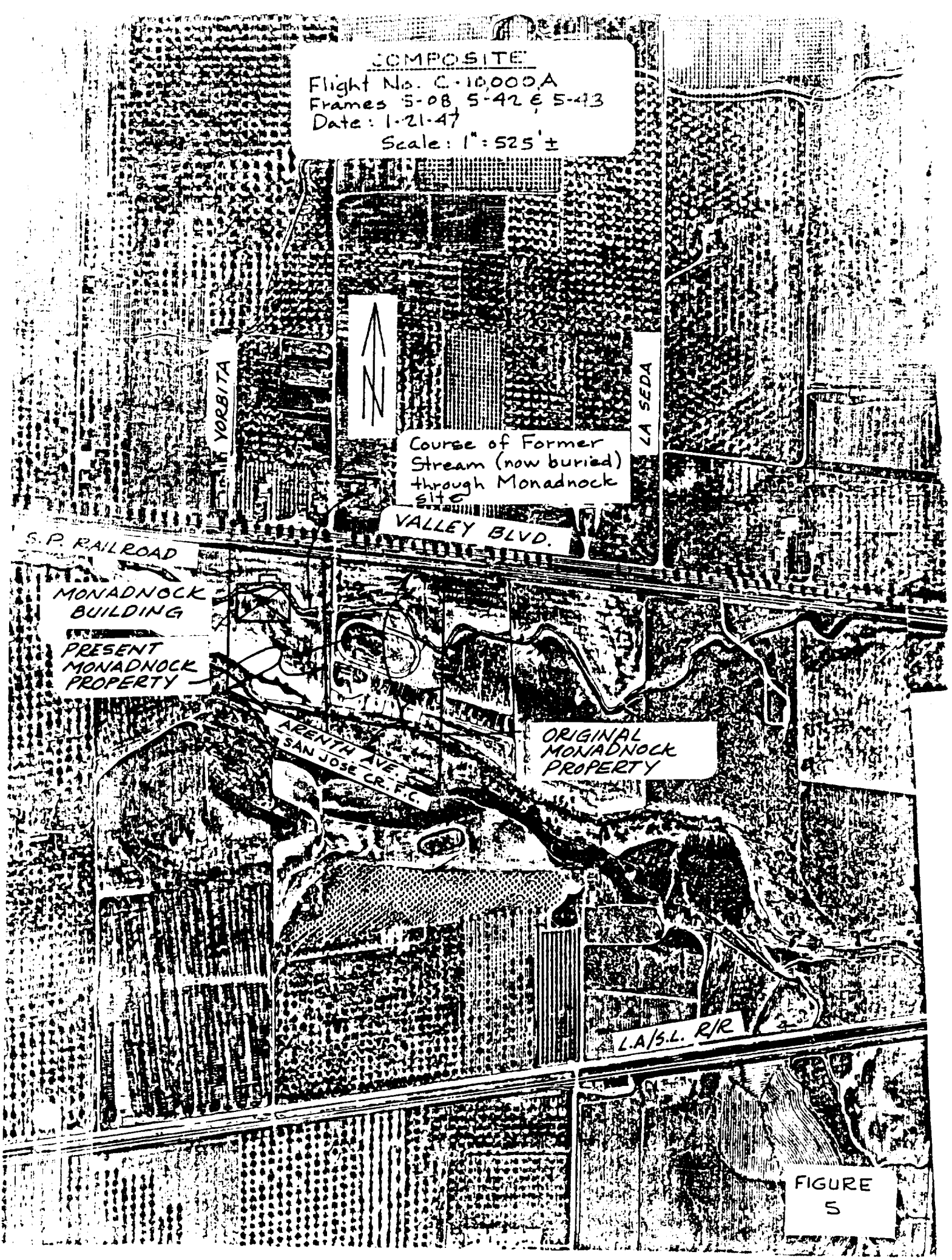

COMPOSITE
Flight No. C-10,000,A
Frames 5-08, 5-42 & 5-43
Date: 1-21-47
Scale: 1" = 525' ±
YORBITA
LA SEDA
Course of Former Stream (now buried) through Monadnock site
VALLEY BLVD.
S.P. RAILROAD
MONADNOCK BUILDING
PRESENT MONADNOCK PROPERTY
ARENTH AVE.
SAN JOSE CR. F.C.
ORIGINAL MONADNOCK PROPERTY
L.A./S.L. R/R

FIGURE 5

likely penetrated, and that the water was from the confined aquifer material of course-grained, well-graded silty sands.

The other two groundwater monitoring wells were drilled on the west side of the plant building. BC-3 (MW-8) was drilled to a depth of 60 feet, and water was encountered at about 39.5 feet below ground surface. This well also appears to have penetrated a clay confining layer, there being coarse-grained, well-graded silty sand below it. BC-3 (MW-8) is located on the westerly property line about 87 feet northerly of MW-2.

BC-5 (MW-7) was also drilled to a depth of 60 feet with water being encountered at about 39 feet. From the log, one might infer that the well had penetrated a confining layer, but this conclusion might also be questioned due to the presence of coarse sands along with sandy silty clay in the layer. Below the layer, however, the same coarse-grained, well-graded silty sand appears. BC-5 (MW-7) is located approximately 54 feet southeasterly from MW-2 in a direction toward the most likely point of spill or leakage and about 50 feet northwesterly therefrom. All three new groundwater monitorings wells were constructed of 4-inch diameter flush threaded schedule 40 polyvinyl chloride (PVC) with 0.01 inch slotted screen extending at least 10 feet above the water table and 20 feet below. The filter pack material used to surround the screened section was clean No. 2/12 Lonestar sand. The 0.01-inch screen size and the No. 2/12 sand pack were both pre-selected by the engineering geologist in order to reduce the production of solids from the well. A minimum two-foot bentonite seal was placed above the filter pack and the remaining annular space was backfiled with cement grout.

The three new groundwater monitoring wells (MW-4, MW-7 and MW-8) were developed by the bail and surge method using a PVC bailer. A bladder pump was used to evacuate approximately three well volumes before the wells were sampled using a teflon bailer.

D.3 Ground Water Test Results

Laboratory analyses were conducted on groundwater samples collected from Wells BC-2 (MW-4), BC-3 (MW-8), and BC-5 MW-7). These samples were analyzed using EPA Test Method 601 for purgeable halocarbons. Results from the analysis indicate that in Well BC-2 (MW-4), located along the easterly property line, the purgeable halocarbon constituents are below detectable limits except for tetrachloroethene (PCE), 1,1,1 - trichloroethane (TCA), and trichloroethylene (TCE). The concentrations of PCE, TCE, and TCA however, are below the California Department of Health Services (DOHS) action levels for contaminants in drinking water.

Results of analyses of groundwater samples from monitoring well BC-3 (MW-8), located 87 feet northerly from MW-2, indicate the following concentrations of contaminants previously the subject of analysis in MW-1, MW-2, and MW-3.

	Actual	DOHS AL
Tetrachloroethene (PCE)	33 ppb	4 ppb
Trichlorethylene (TCE).....	91 ppb	5 ppb
1,1,1 - Trichloroethane (TCA)	3 ppb	200 ppb

Similar results of analyses of groundwater samples from monitoring well BC-5 (MW-8), located between the suspected point of spill or leakage and MW-2 are as follows.

	Actual	DOHS AL
Tetrachloroethene (PCE)	110 ppb	4 ppb
Trichlorethylene (TCE)	180 ppb	5 ppb
1,1,1 - Trichloroethane (TCA)	38 ppb	200 ppb

D.4 Conclusions

From the Brown & Caldwell field investigation conducted on 24 March 1987, the following conclusions are made.

1. In general, the depth to groundwater below the Monadnock site is in the range of 39' - 40'.

2. There appears to be a confining layer of brown clay, 6'-10' in thickness, overlying a coarse-grained, well-graded silty sand water bearing formation of unknown thickness extending to a depth greater than 60 feet.

3. Groundwater flow direction is from east to west in the confined aquifer.

4. Above the confining layer the soils encountered during drilling consisted of alternating beds of brown silty clays of moderate plasticity, clayey and silty fine grained sand with some coarse grain to gravelly sand, and gravels found at the 20 to 30 feet depths.

5. Above the confining layer, the subsurface lenses of soil are unsaturated and appear to be below field capacity.

6. Results of the analysis performed on the groundwater sample extracted for the upgradient Well, BC-2 (MW-4) indicate that concentrations of contamination were below detectable levels or below action levels for drinking water. This indicates that solvents are apparently not migrating onto the site from the east.

7. Analysis of groundwater from Wells BC-3 (MW-8) and BC-5 (MW-7), and sample analyses given in earlier reports, indicates the presence of solvents in the groundwater, along the western boundary of the Monadnock property. This infers that the source is the area near the south west corner of the plant building. The area has been defined in previous studies, where soil removal operations have already occurred and are continuing.

8. The soil borings, BC-4, drilled in the former drum storage area indicated no detectable soil contamination.

SECTION E
RECAP AND DISCUSSION

E.1 General

The locations of all soil borings and groundwater monitoring wells are shown in general on Figure 5 and in Detail on Plate 3 at the back of this report.

E.2 Groundwater Monitoring

There are now six active ground water monitoring wells on the Monadnock site (MW-1, MW-2, MW-3, MW-4, MW-7 and MW-8). It has been determined that the hydraulic gradient of ground water movement in the confined aquifer below the site is from east to west. There is no evidence that the confining layer may be leaking, but the possibility does exist. An attempt will be made to verify this in the aquifer testing program outlined in Section F. While the confining layer may be relatively impermeable to the passage of water, it may transmit solvents more readily.

Two of the monitoring wells (MW-1 and MW-4) are located along the easterly line of the Monadnock property. Analysis of samples from these wells indicate that there is no grossly contaminated ground water entering beneath the site upgradient from the east. This notwithstanding, examination of test results summarized in Table 4 for MW-1 and MW-4 indicates that concentrations of PCE, TCE, and TCA entering the site may be as high as 10 ppb, but are probably less. This is borne out by the results of the San Jose Creek Channel underdrain system sampling program upgradient from Monadnock which indicate typical background levels of < 5ppb for PCE, and < 10 ppb for TCE and TCA.

There are four groundwater monitoring wells generally located along the westerly line of the property within the Monadnock property itself. These are MW-3 at the extreme southwest corner; MW-2 located at approximately the midpoint along the westerly property line; MW-8 located about 87 feet northerly from MW-2; and MW-7 located approximately 54 feet southeasterly from MW-2. Of these monitoring wells, MW-2 consistently shows the highest levels of ground water contamination, averaging 500 ppb of PCE, 540 ppb of TCE, and 220 ppb of TCA. Groundwater samples from MW-7 show the next highest level of contamination, averaging 79 ppb of PCE, 344 ppb of TCE, and 36 ppb of TCA. Samples from MW-8 show average concentrations of 53 ppb PCE, 110 ppb TCE, and 15.5 ppb of TCA. From the most remote monitoring well, MW-3, average concentrations are 44 ppb of PCE, 4 ppb of TCE, and 5 ppb of TCA. Samples from these downgradient monitoring wells do not define a leading edge of groundwater contamination; in fact, it can be inferred that the leading edge of contamination probably lies westerly of the west line of the Monadnock property, and that the plume is now centered at MW-2 with a trailing edge at about MW-7. Groundwater sampling results are summarized in Table 4.

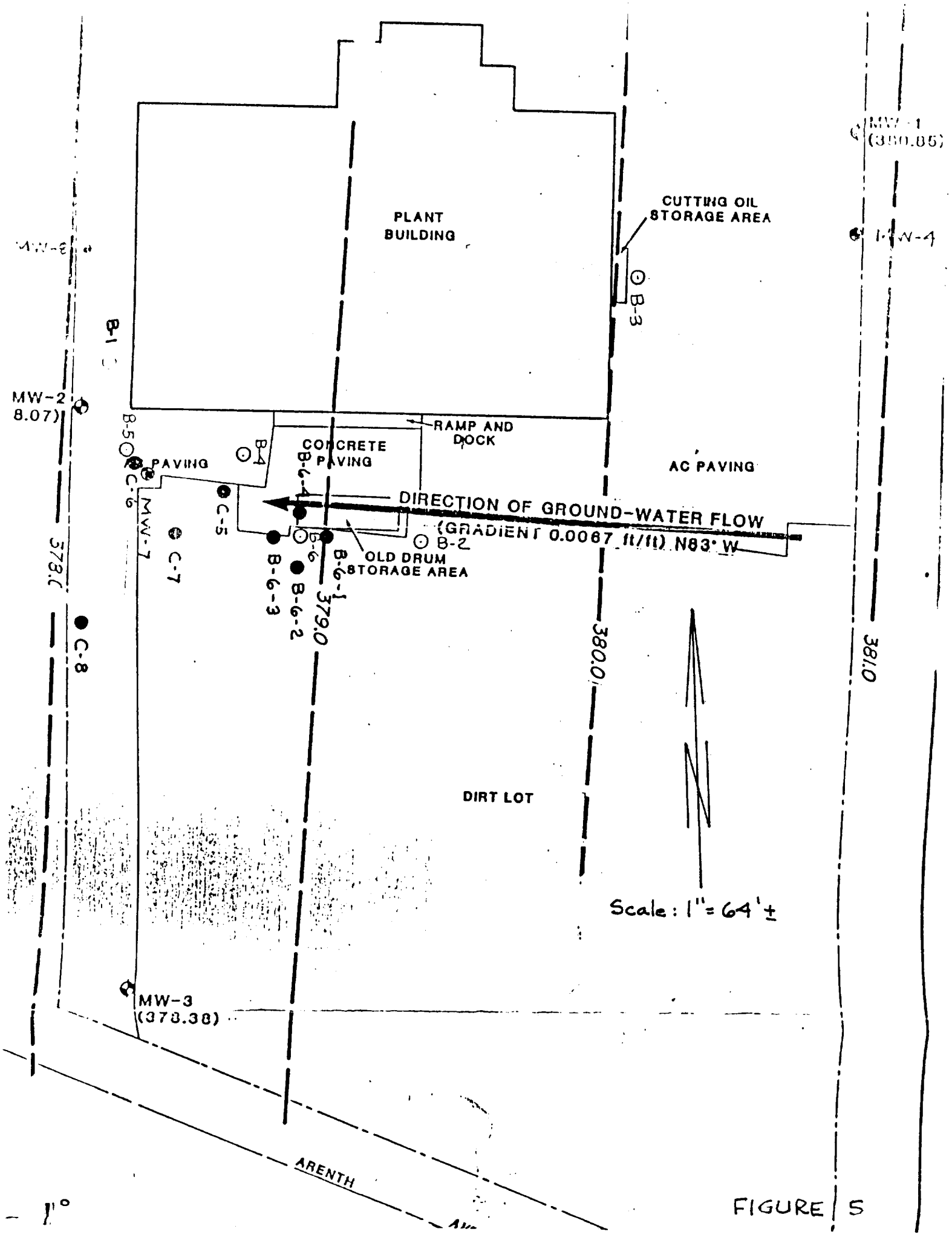

PLANT BUILDING
CUTTING OIL STORAGE AREA
B-3
MW-1 (380.85)
MW-4
MW-2 8.07)
B-5
B-4
PAVING
C-6
MW-7
C-5
C-7
C-8
CONCRETE PAVING
B-6-4
RAMP AND DOCK
AC PAVING
DIRECTION OF GROUND-WATER FLOW
(GRADIENT 0.0067 ft/ft) N83° W
B-6
B-2
OLD DRUM STORAGE AREA
B-6-3
B-6-2
B-6-1
379.0
380.0
381.0
378.0
DIRT LOT
Scale: 1" = 64' ±
MW-3 (378.38)
ARENTH

FIGURE 5

TABLE 4

SUMMARY OF MONITORING WELL SAMPLING RESULTS (ppb)

DOHS ACTION LEVELS: TCE = 5 ppb PCE = 4 ppb TCA = 200 ppb

DATE OF SAMPLE	MW-1			MW-2			MW-3			MW-4			MW-7			MW-8		
	TCE	PCE	TCA	TCE	PCE	TCA	TCE	PCE	TCA	TCE	PCE	TCA	TCE	PCE	TCA	TCE	PCE	TCA
7-28-86	<25	<25	<25	710	310	380	<5	<5	<5									
6-86 (Top)				560	600	180												
16-86 (Bottom)				1000	960	530												
7-86 (0800)				610	660	220												
1-86 (1520)				190	660	<100												
3-86 (1120)				670	760	330												
3-86 (1500)				110	530	370												
1-19-86				710	780	350												
1-23-86				820	840	420												
-27-86				450	440	220												
1-30-86				670	780	250												
2-8-86				410	430	<100												
2-13-86	<5	<5	<5															
1-12-86			WELL	240	50	80												
1-12-86			PUMP	150	20	40												
1-19-86				710	770	350	4	100	6									
1-86 (a.m.)				430	150	50												
1-86 (p.m.)				560	260	60												
-12-86				803	840	403	2	28	5									
30-87				470	130	57												
-3-87				620	190	77												
-30-87										0.5	1.8	0.5	91	33	3	180	110	38
31-87										1.0	1.6	0.5	456	81	48	81	23	4.2
28-87	1.5	0.55	0.3	473	310	83				0.1	1.2	0.4	485	122	58	69	20	4.3
RAGE	10	10	10	540	500	220	4	44	5	0.5	1.5	0.5	344	79	36	110	53	15.5

E.3 Soil Borings

A relatively large number of soil samples have also been taken from at least 14 borings varying in depth from 11.5 feet to 50 feet. Samples from nine of these borings have been analyzed for PCE, TCE, and TCA, generally at intervals of five feet. The results are shown in Table 5 which summarizes concentrations of PCE, TCE, and TCA versus depth and soil type. Surficial soils to about five feet of depth (sometimes 10 feet) are clayey in nature. There appears to be another layer of clayey material at 30 to 50 feet in depth. This appears to be the confining layer. Whether it is leaking or not is unknown, but an assessment of this property will be attempted in the aquifer testing program outlined in Section F. In between, there are layers and lenses of primarily coarse materials interspersed with clay and fine sand.

All of these subsurface characteristics are confined by the Corps of Engineers borings for construction of San Jose Creek Channel shown earlier in Figure 4. Some of the deeper 50' borings obviously penetrated into, but more than likely not completely through the confining layer. In general, the soils above the confining layer appear to consist of fine grained inorganic silts with low to medium compressibility, and inorganic clays with low to medium plasticity. Neither the silts nor clays appear to contain any significant amount of organic material. The values of blow counts, N, indicate that the confining layer is dense, while material above it is erratic in density, ranging from loose to fairly dense. In general, these same soil properties are exhibited in the borings on the Monadnock site, thus confirming the presence of the confining layer approximately 30'- 40' below ground surface with erratically deposited lenses of fine to coarse grained materials above it. That the subsurface layers of soil above the confining layer are unsaturated is shown by the measured moisture content.

In Table 5, PCE, TCE, and TCA concentrations (mg/kg = ppm) are summarized, along with a showing of soil types encountered, at each of the borings. Other than at the surface, the three solvent contaminants appear to be associated with the coarser grained materials, although this is probably related to the amount of silt and clay intermixed to which the contaminants are adsorbed. Except for TCE, the lower clay layer appears to be a barrier against downward migration. On the other hand, there isn't much driving force in the unsaturated zone which is at less than field capacity. Recent work by Mehran, Olsen and Rector, reported in the May-June 1987 issue of "GROUNDWATER", indicates that the velocity of advancement of TCE may be about one-half the average linear pore-water velocity. With little pore water present, the contaminants will move very slowly and reside in the soil column for years, adsorbed on fine-grained materials.

There is little question that soil contamination is concentrated around soil borings B-6, B-6-3, and B-6-4, and, to a lesser extent

Note: Above concentration limit for the 0.005 mg/kg or less

CONSTITUENT	Depth Below Surface at which Sample Taken	SOIL BORING NUMBER								
		B-6	B-6-1	B-6-2	B-6-3	B-6-4	C-5	C-6	C-7	C-8
PCE mg/kg	5'	590@3'		0.073	3.51	0.08				
	10'	0.31		0.15	2.48	0.146		0.017		
	15'			0.007	0.93	0.62		0.009		
	20'		0.006	0.012		0.021	0.104			
	25'									
	30'						0.021	0.095		0.01
	35'		DEPTH LIMIT OF DIGGING					0.24	0.08	
	40'						0.018			
	45'									
	50'									
TCE mg/kg	5'	1.8@3'		0.009	0.018					
	10'	<0.007		0.016	0.006					
	15'									
	20'		0.25	0.011		4.65	0.10			
	25'									
	30'							0.044		0.051
	35'							0.112	0.27	0.036
	40'								0.014	
	45'									
	50'									
mg/kg	5'	12@3'		0.084						
	10'	0.062		0.436		0.006				
	15'									
	20'					1.19	0.05			
	25'									
	30'							0.008		
	35'							0.033		

at B-6-2, with essentially none at B-6-1 (see Figure 5). The depth of boring B-6 was 11.5 feet; the others around B-6 were drilled to 20 feet of depth. At B-6-2 and B-6-4, contaminants have penetrated to the 20' depth level, and perhaps deeper. At this depth, they are considered uneconomical to recover through excavation and removal for transport to an approved disposal site.

It appears that some of the contaminants, primarily PCE and TCE have moved to C-5 and C-6, but are found at greater depths (30'-35') seemingly prevented from further downward migration by the confining layer of clayey material.

Removal of contaminated soils is proposed only around B-6, under the pavement at B-6-3 and B-6-4, and moving through C-5 toward MW-7. As a part of the proposed remedial action, the resulting excavation will be backfilled with clean material and capped with clay to prevent infiltration and percolation.

Stratigraphy of the site is shown in the following figures (See Plate 3 for location of Sections).

Figure 6	Section A-A	taken essentially along the easterly property line from BC-4 through BC-1, MW-4 and MW-1.
Figure 7	Section B-B	taken essentially along the westerly property line from MW-3 through C-8, MW-2 and MW-8.
Figure 8	Section C-C	which is an irregular section through B-6, B-4, C-5, C-7, MW-7, C-6, B-5, MW-2, B-1 and MW-8.

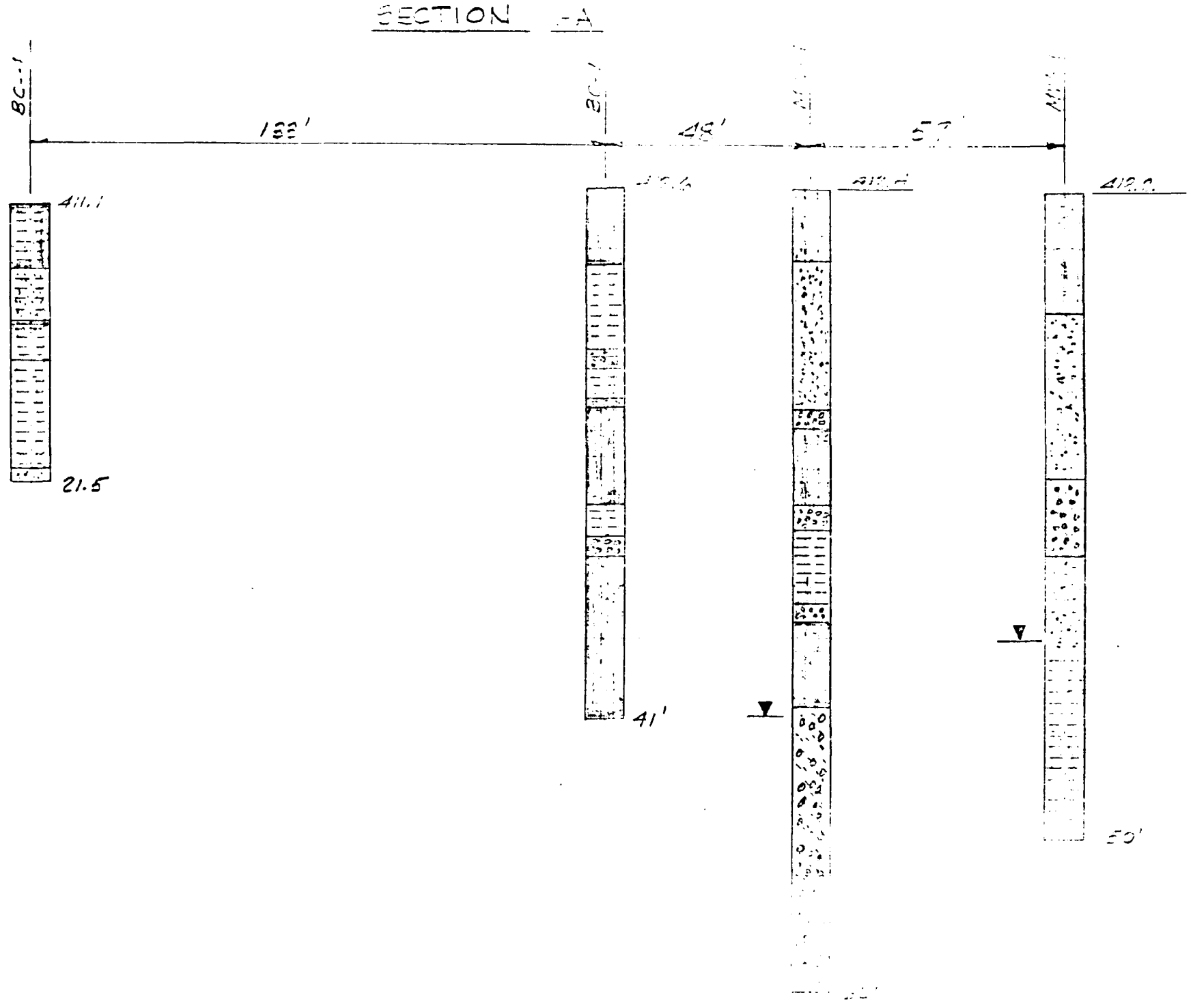
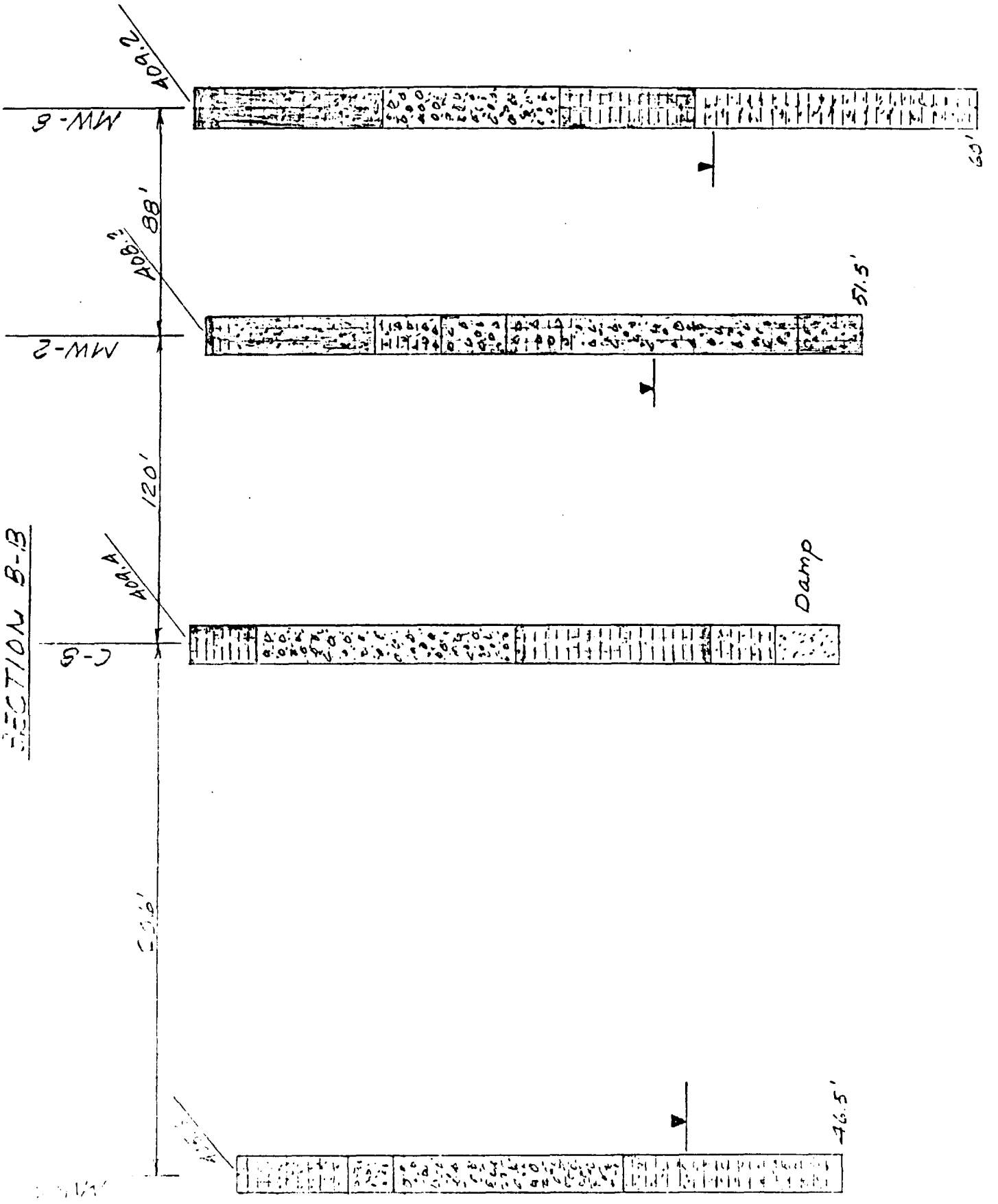
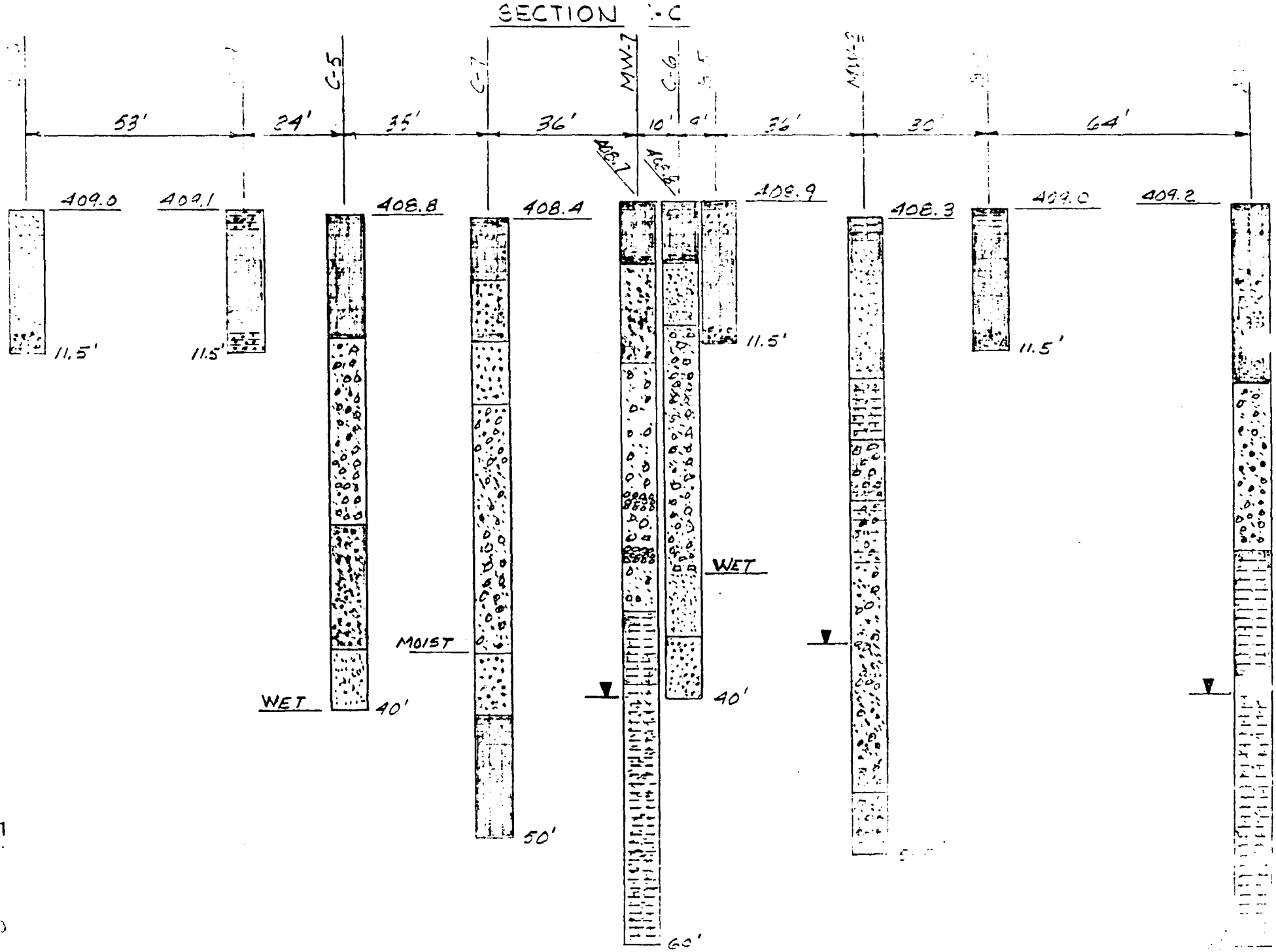


Figure 6



Figure


SECTION C-C
C-5
C-7
MW-7
C-6
MW-3
53'
24'
35'
36'
10'
4'
36'
30'
64'
409.0
409.1
408.8
408.4
409.9
408.3
409.0
409.2
11.5'
11.5'
11.5'
11.5'
WET
MOIST
WET
40'
40'
50'
60'

SECTION F
RECOMMENDED REMEDIAL ACTIONS

F.1 Remedial Actions for Contaminated Soil

The Monadnock Company proposes to undertake and/or complete the following actions to remedy soil contamination which occurred on its property due to past practices prior to 1972.

The locations of soil borings are as generally shown earlier on Figure 5. As also pointed out earlier, most of the contaminants continue to reside in surface layers of soil, clustered around Boring B-6, (except B-6-1), becoming less concentrated but deeper moving toward MW-2.

Approximately 120 cubic yards of soil was excavated in November 1986 from the areas shown on Figure 8 in the First Supplement (17 November 1986) to a depth of about 7.5 feet. All of this material has been disposed of by truck transport to Kettleman Hills.

At the time this excavation was made, it was visually apparent that additional material must be removed from the area of B-6-4 and C-5 moving toward MW-7, but leaving MW-7 intact. A section of existing concrete pavement was removed to permit excavation and removal of visually contaminated soil beneath it. At least another 112 cubic yards of soil was recently removed from this area on 17-18 June 1987, and hauled to Kettlemen Hills. Additional excavation will continue as required after inspection by a representative of TRW during the week of 22 June 1987.

Therefore, the remaining remedial actions proposed to be taken with respect to contaminated soils are as follows.

1. Continue to remove and legally dispose of visually contaminated soil to a depth of up to 10 feet from B-6 toward MW-7.

2. Backfill the resulting excavated hole with clean soil compacted to within approximately two feet of finished grade.

3. Fill the top two feet of the excavated hole with clay material with a permeability of 10^{-6} cm/sec and compact to 95% of maximum density to form a clay cap over any contaminated soils remaining at depth.

4. Repave area with asphalt cement or concrete (2 1/2" - 4" thickness) and drain surface water to existing driveway to Arenth Avenue.

F.2 Remedial Actions for Contaminated Groundwater

The following actions are proposed to be undertaken by the Monadnock Co. with respect to contaminated groundwater beneath the Monadnock property.

FIGURE 4

T.H. 57

Depth	MC	LL	PI	#4	#200	N	Description
	[illegible]	[illegible]	[illegible]	100	53	[illegible] / 21	SANDY CLAY, grayish, brown to tan, stiff
	[illegible]	[illegible]	16	100	68	29 / 23	
	13	36	12	100	65	60	
	7	26	4	100	33	60 / 19	CLAYEY SAND,-SILTY SAND, tan, dense
	8		NP	100	28	19 / 24	SILTY SAND, tan, medium dense
	16	36	19	100	62	38 / 31	SANDY CLAY, brown, dense.
	15	40	22	100	63	31 / 44	
		37	18	100	56	46 / 45	
BEDROCK						60+ (repeated)	SOFT SILTY SHALE Repetto Formation

Drilled Oct. 1964

T.H. 12

EL. 399'±

Depth	Symbol	MC	LL	PI	#4	#200	N	Description
3'	SM	16		NP	100	39	3	SILTY SAND, dark brown, very loose.
6'	CL	26	41	17	100	68	6	SANDY CLAY, dark brown, slight squeezing, medium stiff.
9'	CH	32	52	25	100	79	8	SANDY CLAY, (fat) dark brown, slight squeezing, medium stiff
11'	SM	12		NP	95	20	12	SILTY SAND, dark brown, medium dense
Inv. W 16'	SC	21	31	10	100	41	11	CLAYEY SAND, dark brown, medium dense.
	GW		32	13	39	10	12	SANDY GRAVEL-CLAYEY SANDY GRAVEL, brown, cobbles, moderate caving 16'-19', heavy caving last 2 ft.
24'	GC		29	10	39	6		

Hole abandoned heavy caving. Drilled February 1962

T.H. 13

EL. 391'±

Depth	Symbol	MC	LL	PI	#4	#200	N	Description
3'	SM	11		NP	100	42	7	SILTY SAND, medium gray, loose
6'	CL	15	36	17	100	58	5	SANDY CLAY, dark gray, medium stiff.
9'	SC	17	28	9	100	35	11	CLAYEY SAND, light gray, medium dense.
12'	SC	5	25	7	65	14	39	CLAYEY GRAVELLY SAND, tan, dense.
Inv. 15'	SP	3			60	4	35	GRAVELLY SAND, tan, dense.
18'	SM	21		NP	100	34	10	SILTY SAND, brown, loose.
W 20'	GP	4			32	4	60	GRAVEL, brown, some cobbles, caving, using drilling mud, very dense to medium dense.
24'					43	4	16	
	SP SM	14		NP	62	8	35	GRAVELLY SAND-SILTY GRAVELLY SAND, tan, caving, larger boulder in bottom, dense to very dense.
28.5'		13					54	

Drilled October 1961

(T.H. 60)

EL. 381'±

Depth	Symbol	M.C.	L.L.	PI	#4	#200	N	Description
3'	CH	15	57	35	100	52	[illegible] / 20	SANDY CLAY, dark gray, stiff, fine roots.
6'	CL	12	37	19	100	55	[illegible] / [illegible]	SANDY CLAY, light gray brown, stiff.
7.5'		14	35	12	100	58	[illegible]	
9'	ML	8		NP	100	54	20	SANDY SILT, tan, stiff.
12'	CH	28	61	36	100	72	15 / 22	SANDY CLAY, gray brown, stiff.
15'	SM	16		NP	100	32	20 / 11	SILTY SANDY, brown, medium dense to dense.
Inv. W 16.5' 18'	CL	29	44	21	100	83	15 / 12	SANDY CLAY, gray, stiff.
21'	SP			NP	51	3	60 / 27	GRAVELLY SAND, gray to brown, medium dense to dense.
25'				NP	53	2	36 / 29 / 40	

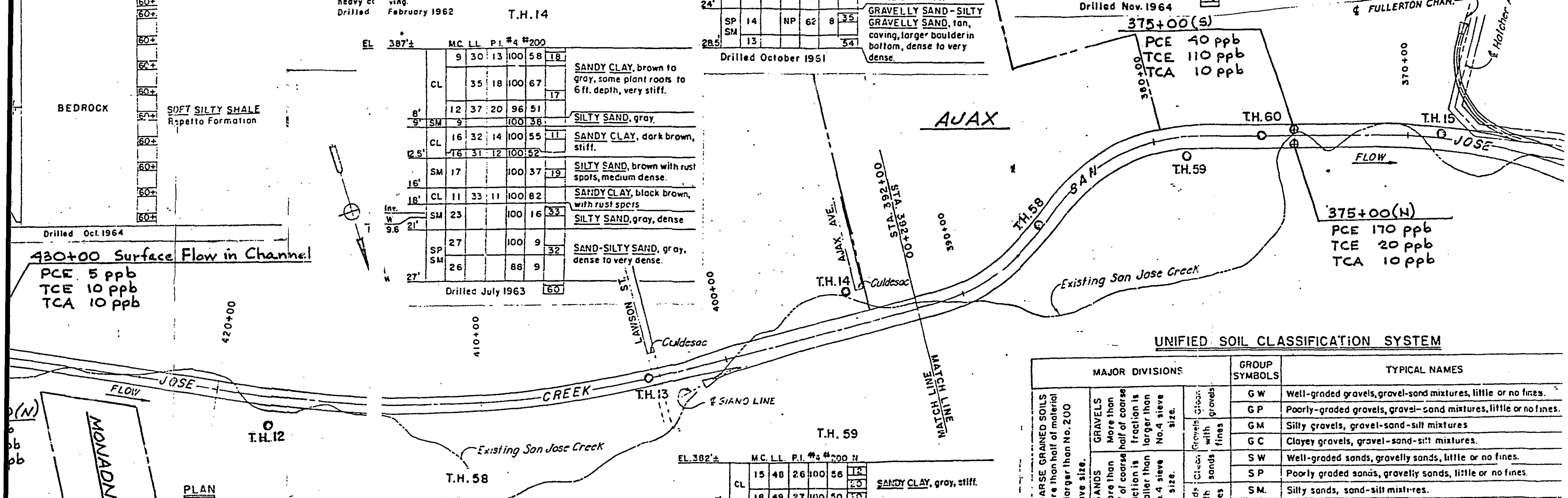
Drilled Nov. 1964

T.H. 14

EL 387'±

Depth	Symbol	M.C.	LL	P.I.	#4	#200	N	Description
	CL	9	30	13	100	58	18	SANDY CLAY, brown to gray, some plant roots to 6 ft. depth, very stiff.
			35	18	100	67	17	
8'		12	37	20	96	51		
9'	SM	9			100	38		SILTY SAND, gray
	CL	16	32	14	100	55	11	SANDY CLAY, dark brown, stiff.
12.5'		16	31	12	100	52		
16'	SM	17			100	37	19	SILTY SAND, brown with rust spots, medium dense.
18'	CL	11	33	11	100	82		SANDY CLAY, black brown, with rust spots
Inv. W 9.6 21'	SM	23			100	16	33	SILTY SAND, gray, dense
	SP SM	27			100	9	32	SAND-SILTY SAND, gray, dense to very dense.
27'		26			88	9	60	

Drilled July 1963



T.H. 58

EL. 370'±

Depth	Symbol	MC	LL	PL	#4	#200	N	Description
	SC	23	40	19	100	44	13 / 8	CLAYEY SAND, gray to grayish brown, loose to medium dense.
Inv. 8'		18	35	16	100	50	10 / 10	SILTY SAND, gray to grayish brown, medium dense.
7.5'	SM	17			100	28	24	
W 9' 10.5'	SW SM			NP	71	6	7 / 7	GRAVELLY SAND-SILTY GRAVELLY SAND, grayish brown, some caving, loose.
	ML				100	64	15	SANDY SILT, gray with rust streaks, slightly micaceous, medium dense to loose.
13.5'					100	54	[illegible]	
16.5'	SM			NP	100	15	[illegible] / 30	SILTY SAND, grayish brown, some squeezing, medium dense.
	SW SM			NP	78	6	17 / 60	
					64	8	19	GRAVELLY SAND-SILTY GRAVELLY SAND, rusty brown, occasional cobbles to 5 inches max. size, medium dense to dense.
					57	7	22 / 60	
					43	9	60 / 35	
30'					40	8	12 / 50	

T.H. 59

EL. 382'±

Depth	Symbol	M.C.	L.L.	P.I.	#4	#200	N	Description
	CL	15	48	26	100	56	12 / 25	SANDY CLAY, gray, stiff.
5'		18	49	27	100	50	30	
7.5'	SM	10		NP	100	33	26 / 16	SILTY SAND, brownish gray, medium dense.
	CL	21	42	20	100	65	19 / 17	SANDY CLAY, grayish brown, slightly micaceous, medium dense.
12.5'		20	28	8	100	56	13	
	SM	17		NP	100	30	24 / 20	SILTY SAND, grayish brown, slightly micaceous, medium dense.
18.5'		25		NP	100	24	10 / 11	
Inv. W 21.5'	SP			NP	57	3	35 / 30	GRAVELLY SAND, grayish brown, medium dense.
24'	GP			NP	50	4	21 / 13	SANDY GRAVEL, grayish brown, medium dense.
	SM		30	6	100	44	42	SILTY SAND, black, some squeezing, medium dense to dense.
27'			29	6	100	34	26	
	SP SM			NP	60	9	29 / 22	SANDY GRAVEL-SILTY SANDY GRAVEL, brown to rust brown, medium dense to dense.
				NP	48	6	39 / 32	
35'				NP	58	7	35	

Drilled Nov. 1964

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS More than half of material is larger than No. 200 sieve size.	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size.	Clean gravels	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-silt mixtures.
	SANDS More than half of coarse fraction is smaller than No. 4 sieve size.	Clean sands	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands, gravelly sands, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS More than half of material is smaller than No. 200 sieve size.	SILTS AND CLAYS	Low liquid limit	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts, with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silt-clays of low plasticity.
		High liquid limit	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silt soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays or medium to high plasticity, organic silts
Highly organic soils			Pt	Peat and other highly organic soils.

NOTES:

1. Boundary Classification: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well-graded gravel-sand mixture with clay binder.

2 All sieve sizes on this chart are U.S. Standard.

3 The terms "silt" and "clay" are used, respectively, to distinguish materials exhibiting lower plasticity from those with higher plasticity. The minus No. 200 sieve material is silt if the liquid limit and plasticity index plot below the "A" line on the plasticity chart (Plate 2, Technical Memorandum No 3-357), and is clay if the liquid limit and plasticity index plot above the "A" line on the chart.

T.H. 10

Depth	Symbol	MC	LL	PI	#4	#200	N	Description
-3?±	SM	7			100	20	7	SILTY SAND, tannish gray, loose.
		2			100	20	4	
5'	SM	12		NP	79	20	3	SILTY GRAVELLY SAND, dark gray, caving, using drilling mud, very loose.
W 6' / 9'	SC	37	25	7	58	16	3	GRAVELLY CLAYEY SAND, dark gray, very loose.
12'	CL	37	32	10	76	56	20	GRAVELLY SANDY CLAY, dark gray, very stiff.
15'	CL	13	34	14	100	59	20	SANDY CLAY, tan, traces of organic material, very stiff to stiff.
		26	37	15	100	61	11	
21'	SC	23	28	8	100	44	7	CLAYEY SAND, light tan, traces of organic material, loose to medium dense.
		20	29	10	100	44	11	GRAVELLY SAND-SILTY GRAVELLY SAND, tan, dense.
27'	SP SM			NP	81	11	32	
28.5'	SM	26		NP	100	46	9	SILTY SAND, light tan, loose.
33'	SP SM	16		NP	74	6	24	GRAVELLY SAND-SILTY GRAVELLY SAND, grayish tan, medium dense to very dense.
		17		NP	65		60+	
39'	SM	38		NP	72	24	11	SILTY GRAVELLY SAND, dark bluish gray, few c cobbles, medium dense.
42'	SP SM	11		NP	82	7	60+	GRAVELLY SAND-SILTY GRAVELLY SAND, grayish tan, very dense, large boulder, some schistose material.
45'							60+	

Drilled Oct. 1961

T.H. 55

EL 449±

Depth	Symbol	MC	L.L	PI	#4	#200	N	Description
	ML	4		NP	100	51	60, 60	SANDY SILT, brown, dense to medium dense.
5'		5		NP	100	52	18	
8'	CL	11	27	8	100	59	16, 15	SANDY CLAY, light brown, stiff
	ML	9		NP	100	76	22, 8	SANDY SILT, tan, loose to very dense
		11		NP	100	78	16, 16	
		13		NP	100	51	42, 36	
		13	36	6	100	84	32, 60	
21'		10			100	58	56	
24'	SM	7		NP	100	40	41, 50	SILTY SAND, tan, dense.
27'	SP SM	4			100	11	26, 45	SAND-SILTY SAND, tan, dense.
30'	SM	6			68	13	60, 60	SILTY GRAVELLY SAND, gray, very dense.
33'	SP SM	4			72	5	60, 60	GRAVELLY SAND-SILTY GRAVELLY SAND, brown, very dense to dense.
Inv. 35.5' / 36'	SM	16			73	13	34, 60	SILTY GRAVELLY SAND, brown, very dense.
	SP SM				70	9	55	GRAVELLY SAND-SILTY GRAVELLY SAND, brown, medium dense, caving below 38 feet
40'					73	8	18	
	SC SM		29	7	87	32	18, 42	GRAVELLY SILTY SAND-GRAVELLY CLAYEY SAND, gray brown, medium dense to dense.
46'		29	7		87	35	31, 16	
50'	SM			NP	100	36	44, 22, 35	SILTY SAND, gray brown, medium dense to dense.

Drilled Oct. 1964

T.H. 56

EL 450'±

Depth	Symbol	M.C	L.L	PI	#4	#200	N	Description
3'	ML	4		NP	100	52	60, 60	SANDY SILTY, brown, very dense.
6'	SM	6		NP	100	46	60, 44	SILTY SAND, reddish, brown, very dense to dense
9'	ML	10		NP	100	55	41, 34	SANDY SILTY, rusty, tan, dense.
12'	CL	14	30	9	100	65	30, 35	SANDY CLAY, rusty, tan, stiff.
15'	SM	20	35	6	69	43	52, 60+	SILTY SAND, gray, rusty streaks, very dense
18'	SM	15		NP	81	31	60+, 60+	GRAVELLY SILTY SAND, gray rusty streaks, very dense
Inv. W 39.5 / 50'	BEDROCK						60+ (each test)	SOFT SILTY SHALE Repetto Formation.

Oct. 1964 Drilled

T.H. 57

EL. 455'±

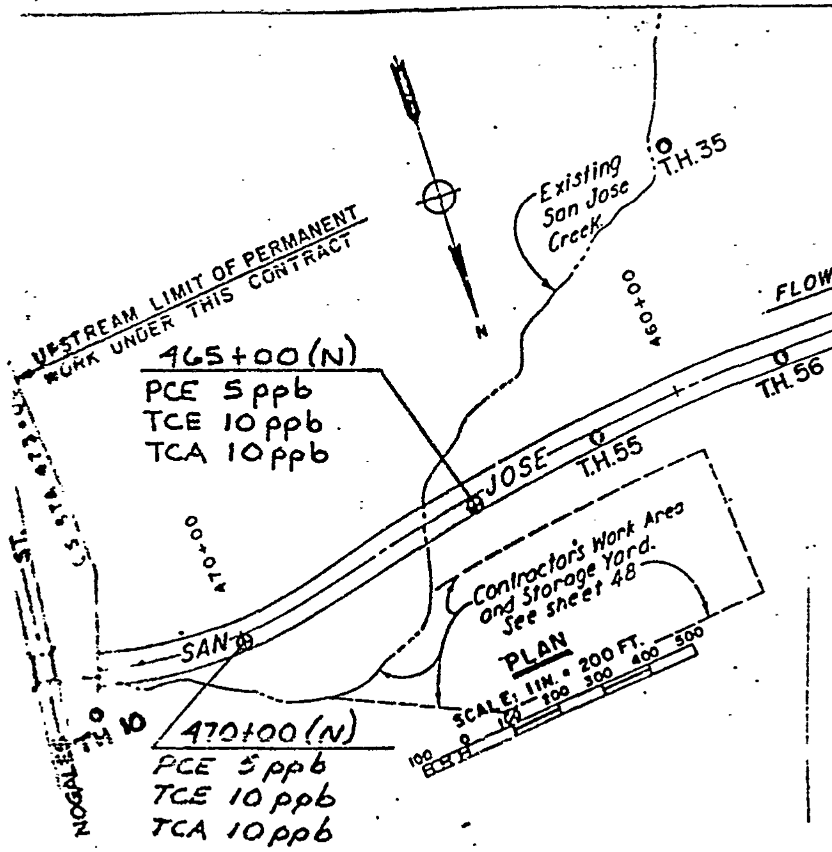
Depth	Symbol	MC	LL	PI	#4	#200	N	Description
		8	28	10	100	53	32, 21	SANDY CLAY, grayish, brown to tan, stiff
		13	38	16	100	68	29, 23	
7'		13	36	12	100	65	60	CLAYEY SAND,-SILTY SAND, tan, dense
10'		7	26	4	100	33	60, 19	
13'		8		NP	100	28	19, 24	SILTY SAND, tan, medium dense
		16	36	19	100	62	38, 31	SANDY CLAY, brown, dense.
		15	40	22	100	63	31, 44	
22.5'			37	18	100	56	48, 45	
W 36' / Inv. 50'	BEDROCK						60+ (each test)	SOFT SILTY SHALE Repetto Formation

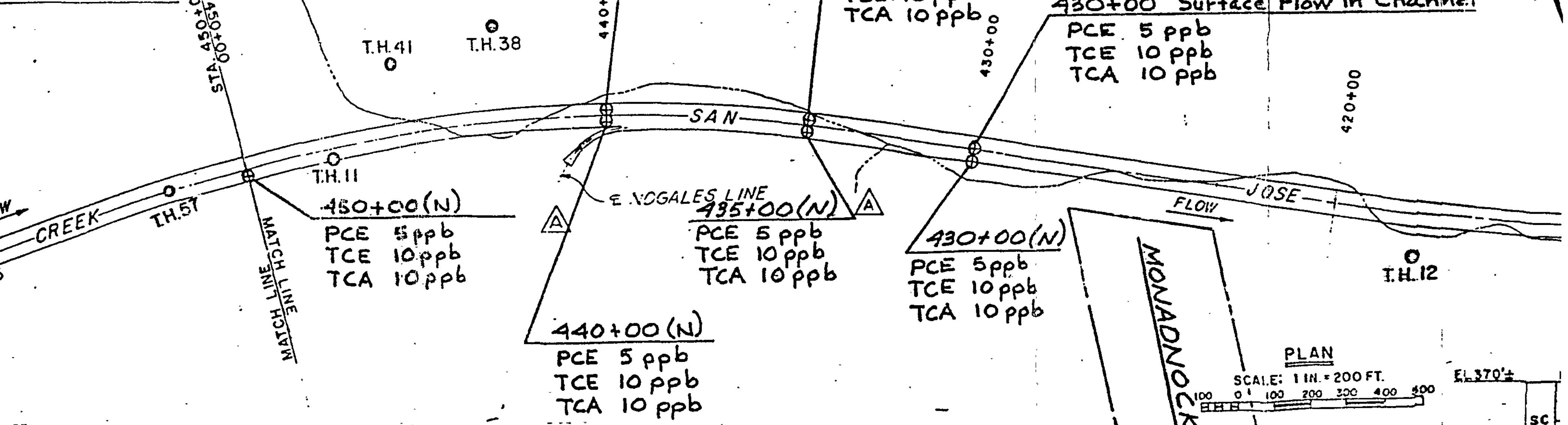
Drilled Oct. 1964

EL. 399'±

Depth	Symbol	MC
3'	SM	16
6'	CL	26
9'	CH	32
11'	SM	12
	SC	21
Inv. W 16'	GW	
24'	GC	

Hole ab[...] heavy c[...] Drilled





LEGEND

T.H.35	Number and location of test hole.
SM	Group symbol, see unified soil classification system.
N	Number of blows of a 140-lb. hammer, with a 30-inch free fall, necessary to drive a standard penetrometer 1 foot after seating 6 inches. Outside diameter of penetrometer is 2 inches and inside diameter is 3/8 inches.
MC	Moisture content in percent of dry weight.
LL	Liquid limit.
PI	Plasticity index (Liquid limit - Plastic limit)
#4	Percent of material by weight passing No. 4 sieve.
#200	Percent of material by weight passing No. 200 seive.
W / 12'	Depth to ground water.
Inv.	Invert of proposed channel at ℄.
NP	indicates nonplastic by test.

T.H. 11

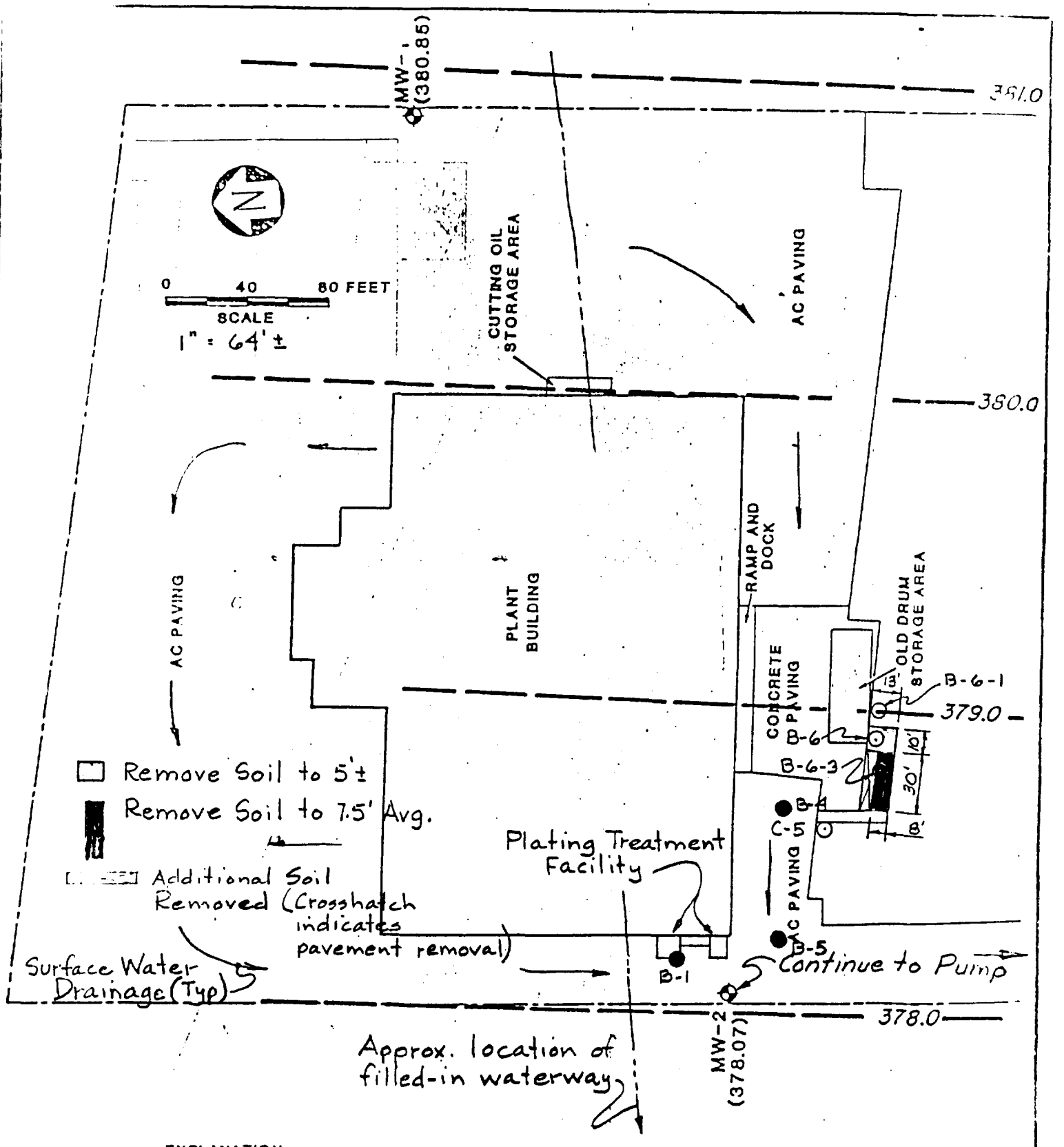
EL 420±

Depth	Symbol	MC	LL	P.I.	#4	#200	N	Description
	CL	15	28	9	100	54		SANDY CLAY, dark brown, soft.
6'		13					3	
9'	SC	9	27	7	51	13	1	GRAVELLY CLAYEY SAND, buff, very loose.
W 10' / 12.5'	SP SM	16			59	10	16	GRAVELLY SAND-SILTY GRAVELLY SAND, buff, medium dense.
	SM	30		NP	74	32	50	GRAVELLY SILTY SAND, dark gray to light gray, dense to very dense.
		24					40	
Inv.		27		NP	58	13		
19.5'		18		NP	87	39	60	

Hole abandoned, Heavy caving
Drilled April 1963

EL. 370'±

Depth	Symbol
Inv. 6'	SC
7.5'	SM
W 9' / 10.5'	SW SM
13.5'	ML
16.5'	SM
30'	SW SM



EXPLANATION:

—380.0— LINE OF EQUAL ELEVATION IN GROUND-WATER LEVEL

MW-1 ◆ GROUND-WATER MONITORING WELL

(380.85) WATER LEVEL ELEVATION IN FEET (MSL)

B-6 ⊙ SOIL BORING

Revised 11-17-86

PROPOSED REMEDIAL ACTION PLAN

Figure 8

1. Under the direction of Robert C. Fox, Consulting Engineering Geologist, aquifer tests (pumping tests) will be made using existing monitoring wells, MW-2, MW-7, and MW-8, in order to measure the response of the potentiometric surface in the confined aquifer, or semi-confined aquifer if it is, in fact, leaking. During the course of the pumping tests, all three monitoring wells, at one time or another, will be used as the pumping well, with the remaining two serving as observation wells.

   Among the factors to be determined will be:

   a. depth to water
   b. drawdown (cone of depression)
   c. specific yield
   d. transmissivity
   e. pumping rate of flow out of the ground
   f. injection rate of flow into the ground
   g. horizontal and vertical hydraulic conductivity
   h. radial anisotrophy

2. Based on the above data, the Monadnock Company will design a groundwater recovery treatment, and re-injection system. The recovery pump will be installed in MW-2. The treatment system will consist of an air stripping tower. Stripped off-gases will be passed through activated carbon filters prior to atmospheric discharge. Decontaminated water will be re-injected to either MW-7 or MW-8 or both.

3. Purchase and install system

4. Operate system and treat contaminated ground water from beneath site until DOHS Action Levels for PCE, TCE and TCA are all met.

APPENDIX A
San Jose Creek Channel
Underdrain System Test Results (AnaCon Labs)
and
AnaCon Labs QA/QC Sheets

AnaCom Inc.
PLATING SOLUTION AND
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

Ralph Wagner Consulting Engineer
P.O. Box 13
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected copy
LAB NO. 7-02-10-112
PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Contr
Channel at Station 375+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	0.17	mg/L
TCE	EPA # 601	0.02	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

Ralph Wagner Consulting Engineer
P.O. Box 13
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected copy
LAB NO. 7-02-10-113
PERMIT NO. .....

SAMPLE TYPE: Subdrain Grab

SAMPLE POINT: San Jose Creek Flood Contr
Channel at Station 435+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA 601	<0.005	mg/L
TCE	EPA 601	<0.01	mg/L
1,1,1 TCA	EPA 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

Ralph Wagner Consulting Engineer
P.O. Box 13
Lake Arrowhead, CA 92352

March 30, 1987
Corrected Copy

LAB NO. 7-02-10-114

ATTENTION: Ralph Wagner

PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood [illegible] Channel at Station [illegible]

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	<0.005	mg/L
TCE	EPA # 601	<0.01	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

ANATEK
PLATING SOLUTION ANALYSIS
24 HOUR SERVICE

Ralph Wagner Consulting Engineer
P.O. Box 13
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected Copy
LAB NO. 7-02-10-115
PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Cont. Channel at Station 40+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	<0.005	mg/L
TCE	EPA # 601	<0.01	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

ANALYTICAL
PLATING SOLUTION
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

Ralph Wagner Consulting Engineer
P.O. Box 11
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected Copy
LAB NO. 7-02-10-116
PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Cont
Channel at Station 465+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	<0.005	mg/L
TCE	EPA # 601	<0.01	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

ANALYTICAL LABORATORIES
PLATING SOLUTION ANALYSIS
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

Ralph Wagner Consulting Engineer
P.O. Box 10
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected Copy
LAB NO. 7-02-10-117
PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Contr Channel at Station 375+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	0.04	mg/L
TCE	EPA # 601	0.11	mg/L
1,1,1 TCA	EPA # 601	0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

Ralph Wagner Consulting Engineer
P.O. Box 19
Lake Arrowhead, CA 92352

March 30, 1987
Corrected Copy

LAB NO. 7-02-10-118
PERMIT NO. .....

ATTENTION: Ralph Wagner

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Cont
Channel at Station 430+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	<0.005	mg/L
TCE	EPA # 601	<0.01	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

AnaCon Lab
PLATING SOLUTION ANALYSIS
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

Ralph Wagner Consulting Engineer
P.O. Box 13
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected Copy
LAB NO. 7-02-10-119
PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Contr Channel at Station 435+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	<0.005	mg/L
TCE	EPA # 601	<0.01	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

Ralph Wagner Consulting Engineers
P.O. Box 13
Lake Arrowhead, CA 92352

March 30, 1987
Corrected Copy
LAB NO. 7-02-10-120
PERMIT NO. .....

ATTENTION: Ralph Wagner

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Control Channel at Station 40[illegible]

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	0.013	mg/L
TCE	EPA # 601	0.013	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

AnaCon Labs
PLATING SOLUTION ANALYSIS
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

Ralph Wagner Consulting Engineer
P.O. Box 13
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected Copy
LAB NO. 7-02-10-121
PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Control Channel at Station 47+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	<0.005	mg/L
TCE	EPA # 601	<0.01	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

ANALYTICAL LABORATORY
PLANNING • DESIGN • CONSULTATION
METAL FINISHING POLLUTION CONTROL
24 HOUR SERVICE

Ralph Wagner Consulting Engineer
P.O. Box 13
Lake Arrowhead, CA 92352
ATTENTION: Ralph Wagner

March 30, 1987
Corrected Copy
LAB NO. 7-02-10-122
PERMIT NO. .....

SAMPLE TYPE: Subdrain System Grab

SAMPLE POINT: San Jose Creek Flood Control Channel at Station 430+00

FLOW RATE: .....

TIME: Date Received: 2/10/87

	Method	Analysis	
PCE	EPA # 601	<0.005	mg/L
TCE	EPA # 601	<0.01	mg/L
1,1,1 TCA	EPA # 601	<0.01	mg/L

Note: Received from The Monadnock Co.

c.c. The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
Attn: Jim Daunt

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

AnaCom Labs
PLATING SOLUTION ANALYSIS
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

April 16, 1987

LAB NO. 7-03-25-229
PERMIT NO. .....

SAMPLE TYPE: Water Sample
3/24/87
FLOW RATE: .....

SAMPLE POINT: San Jose Cheek Flood Cont Channel Flow Station 405+00
TIME: Date Received: 3/25/87

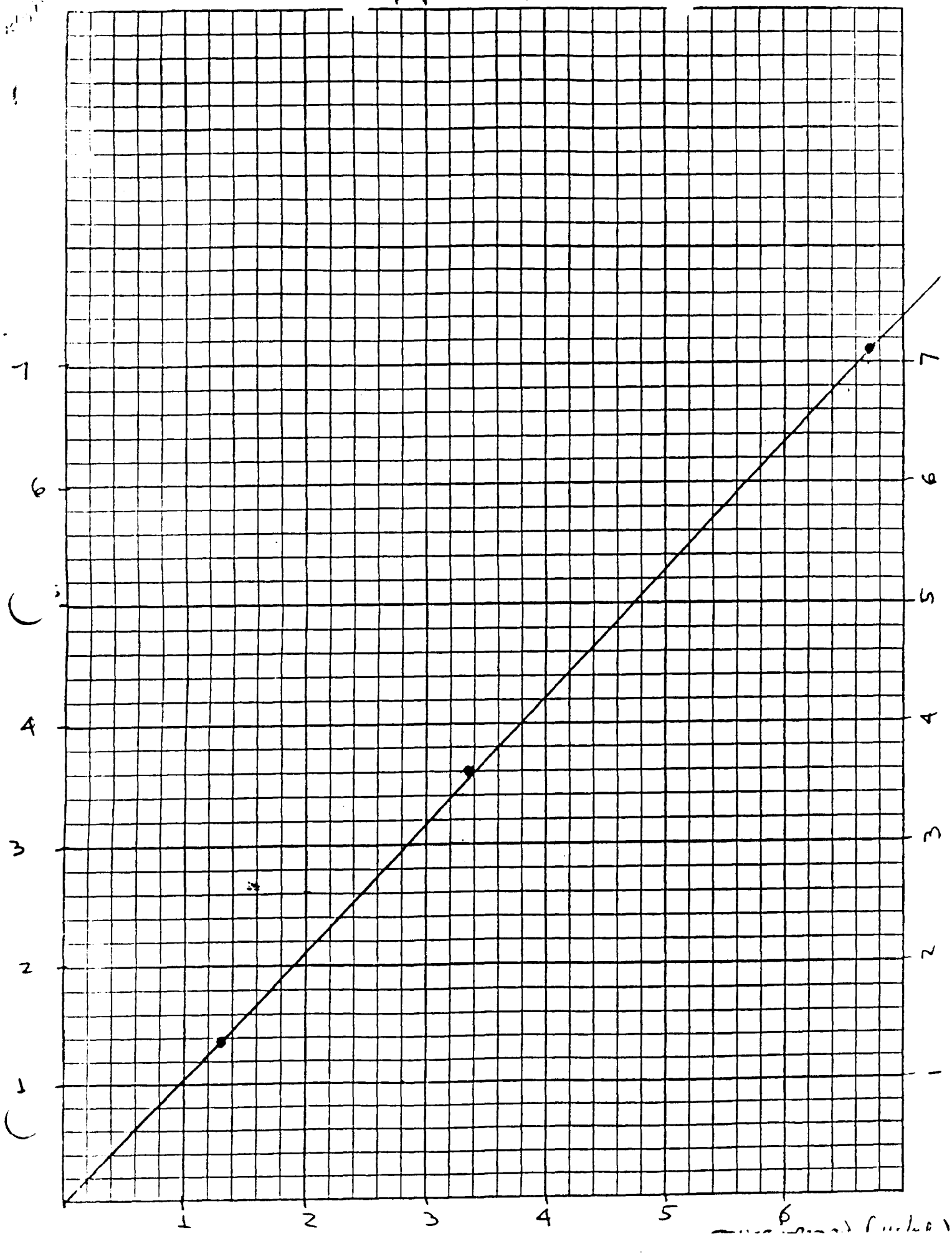
	Method	Analysis
TCE	EPA 8010	None Detected
PCE	EPA 8010	None Detected
TCA	EPA 8010	None Detected

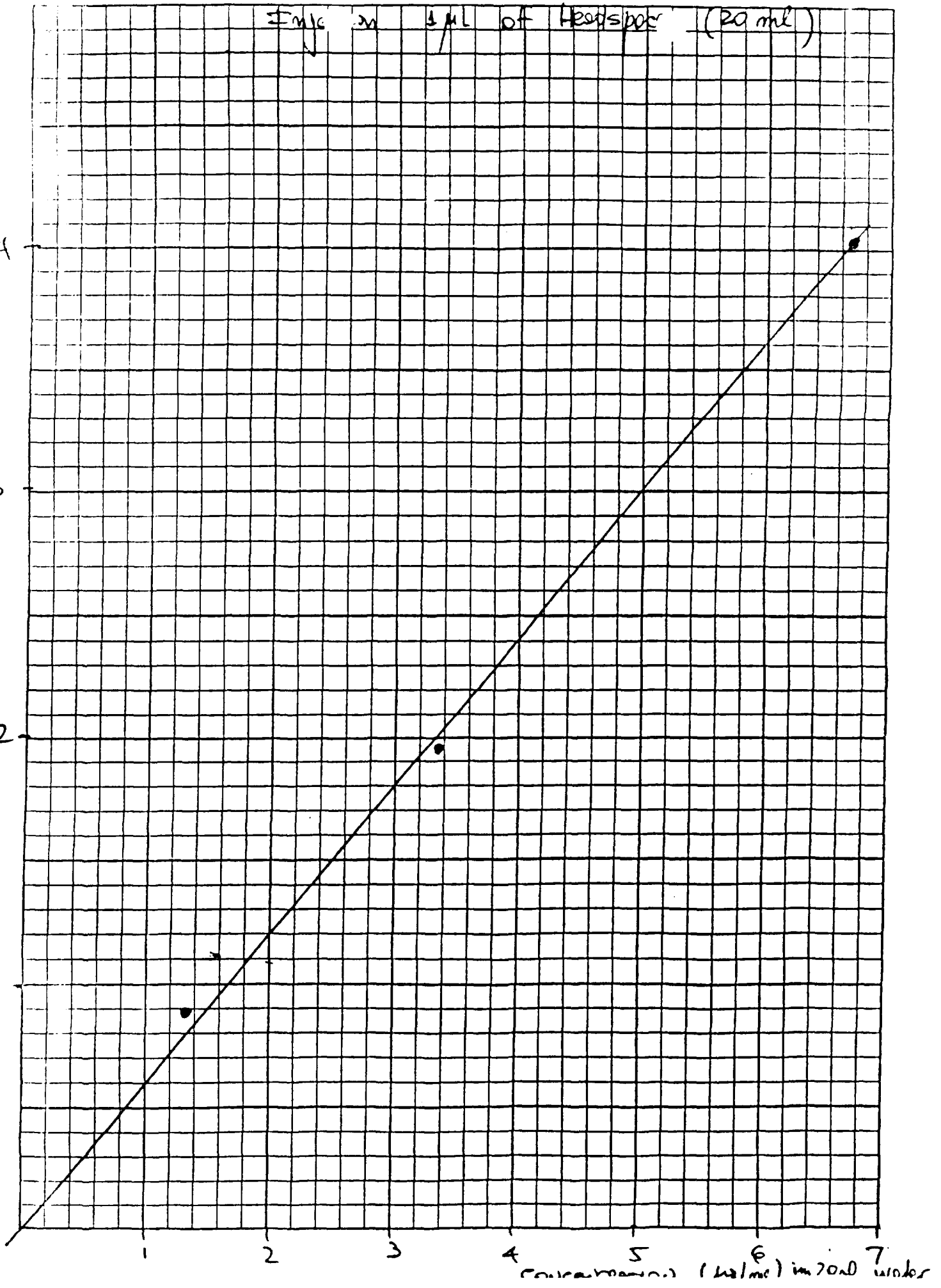
cc. To Wagner Construction.

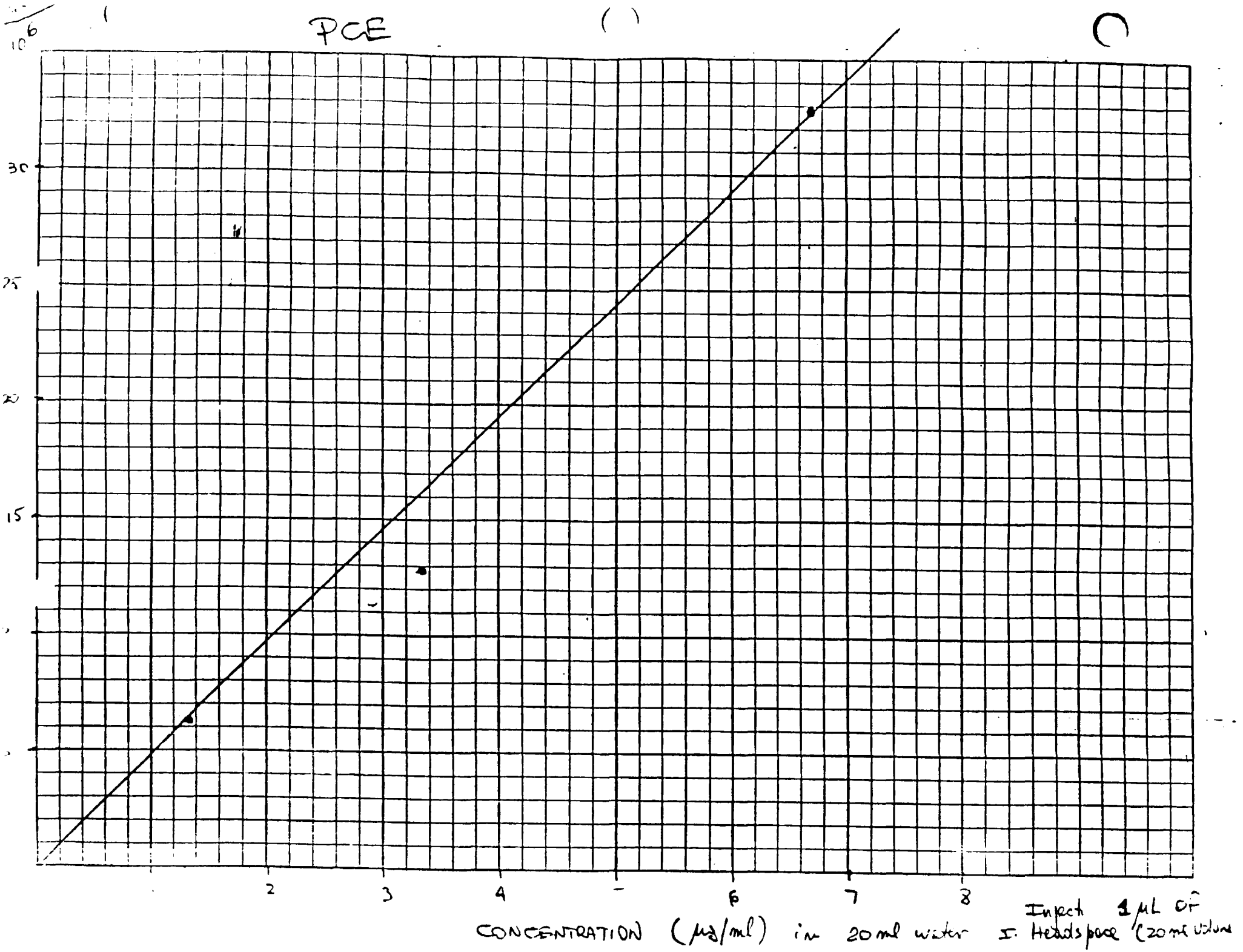
ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

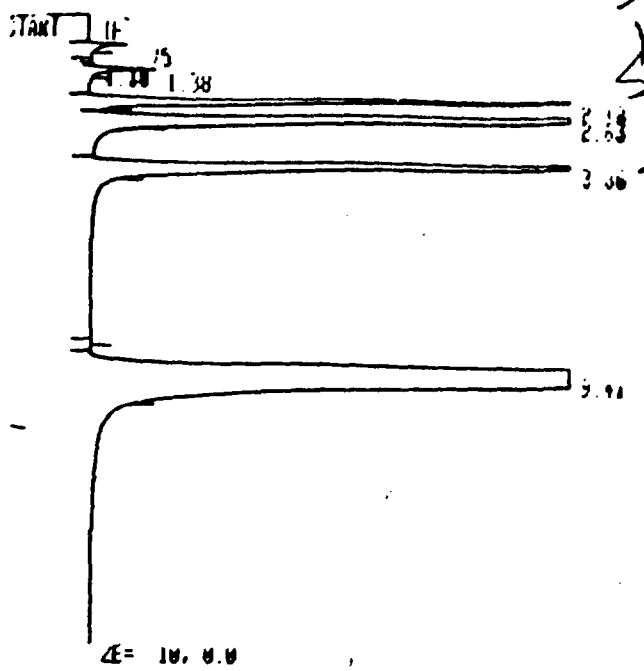

1,1,1-TCA
1
2
3
4
5
6
7


Inj. in 1 µL of Headspace (20 mL)
4
3
2
1
1
2
3
4
5
6
7


PCE
10^6
30
25
20
15
2
3
4
6
7
8
CONCENTRATION (µg/ml) in 20ml water
Inject 1µL of
I. Headspace (20ml volume

2nd 10 water

STD 5λ spike → 1k spike



AE= 10, 0.0
STOP

RUN # 82 FEB/04/87 13:40:38

AREA%

RT		AREA	TYPE	AK/HT	AREA%
0.75		44378	PB	0.086	0.457
1.19		592	BP	0.064	0.006
1.30		1151	PV	0.041	0.012
1.38	—	87493	VB	0.096	0.901
2.18	—	975870	PB	0.100	10.049
2.63	—	3506300	PB	0.112	36.105
3.86	—	1963400	PB	0.161	20.218
9.41	-	1.2844E+07	PB	0.360	132.250

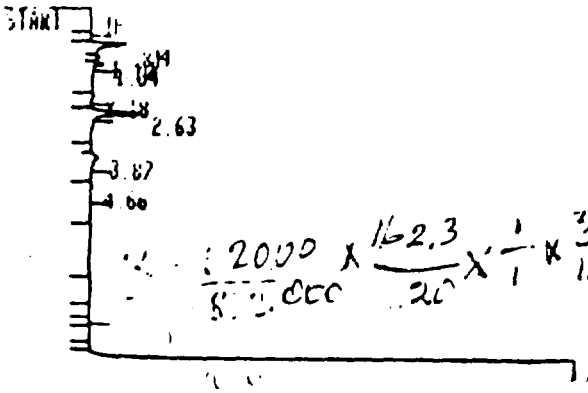
TOTAL AREA= 1.9423E+07
MUL FACTOR= 2.0000E+00

10/40

7-0376-4 end seed Dil → 1λ

LIST: ZERO = 10,-0.1

LIST: ZERO = 10, 0.0



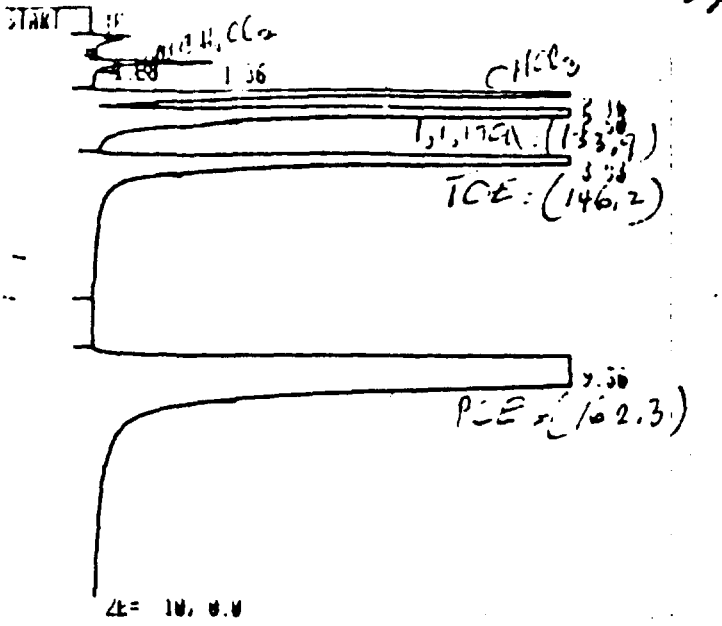
$\frac{2000}{500} \times \frac{162.3}{20} \times \frac{1}{1} \times \frac{20}{10} = 25.6$ ppm

E @ 35°C

STD 80:0
10λ spike
20/40 water
→ 1λ

LIST: ZERO = 10, 0.0

LIST: ZERO = 10, 0.0



STOP

RUN 8 /8 FEB/04/87 11:53:06

AREA%

RT		AREA	TYPE	AR/HT	AREA%
0.73		27564	PV	0.051	0.119
0.80		58109	VV	0.141	0.252
1.15		2596	VV	0.077	0.011
1.28		4149	VV	0.044	0.018
1.36	—	156396	VB	0.094	0.678
2.16	—	1990200	PB	0.101	8.622
2.68	—	7893000	PB	0.114	34.205
3.83	—	4020400	PB	0.165	17.418
9.36	—	3.2812E+07	PB	0.381	142.150

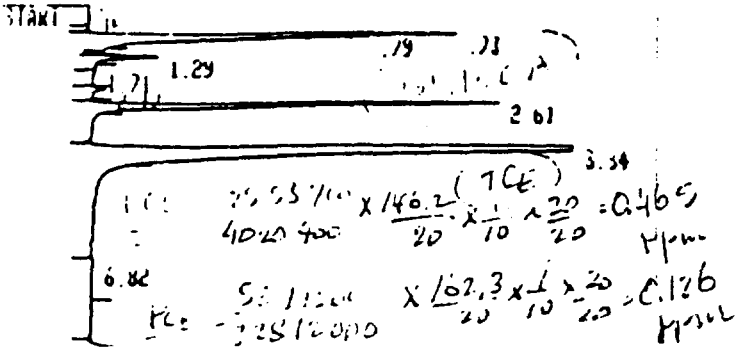
TOTAL AREA= 4.6165E+07
MUL FACTOR= 2.0000E+00

7-0368 →
Area 88 → 10λ

20/40

1,1,1-TCA: $\frac{601660}{1093000} \times \frac{133.9}{20} \times \frac{1}{10} \times \frac{20}{20} \cdot \frac{66.8}{5} = 0.546$ ppm

LIST: ZERO = 10, 0.0

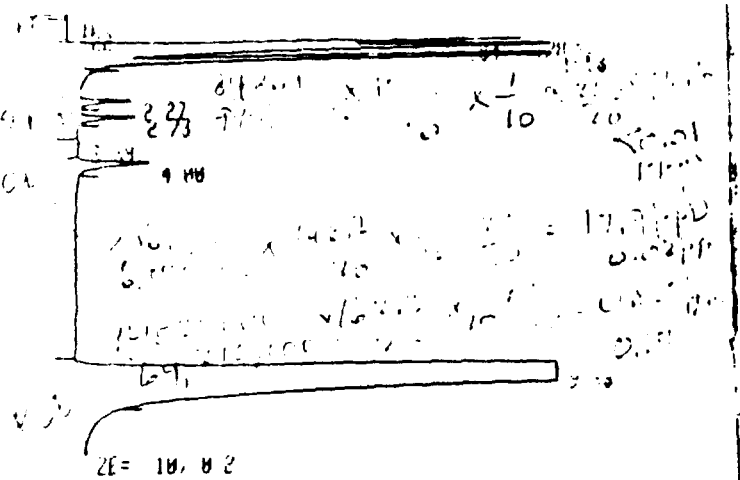


TCE: $\frac{20.53}{4020400} \times \frac{146.2}{20} \times \frac{1}{10} \times \frac{20}{20} = 0.465$ ppm

PCE: $\frac{5.11}{3281200} \times \frac{162.3}{20} \times \frac{1}{10} \times \frac{20}{20} = 0.126$ ppm

ZERO = 10,-0.1

ZERO = 10, 0 0



ZE= 10, 0 2

STOP

RUN # 159 FEB/12/87 11:4[illegible] 10

AREA% RT	AREA	TYPE	AR/HT	AREA%
0.22	1158	PP	0.345	0 [illegible]
0.78	273320	PV	0.042	0 [illegible]
0.84	389670	VV	0.057	0 [illegible]
0.92	1112200	VV	0.097	1 [illegible]
1.18	1806200	VB	0.059	3 [illegible]
2.27	76022	BB	0.102	0 [illegible]
2.73	84861	BB	0.103	0 [illegible]
3.39	3164	BP	0.188	0 [illegible]
4.00	161460	PB	0.156	0 [illegible]
9.68	1.4027E+07	PB	0.375	23 [illegible]

TOTAL AREA= 1.7855E+07

MUL FACTOR= 3.0000E-01

Lab # 7-02-10-112

Run on 11 = 20/40 → 10λ

(1)

Blank

Air 10λ

START IF .81

ZE= 10, 0.0

STOP

RUN # 161 FEB/12/87 12:0[illegible] 24

AREA% RT	AREA	TYPE	AR/HT	AREA%
0.81	381680	PB	0.000	10 [illegible]

TOTAL AREA= 381680

MUL FACTOR= 3.0000E-01

20/40 7-04-55 Run # 11 → 11

Injection 10μL

Run 20

START IF .83

1.39

2.70

3.97

9.63

ZE= 10, 0.0

STOP

(2)

RUN # 162 FEB/12/87 12:12:06

AREA% RT	AREA	TYPE	AR/HT	AREA%
0.78	329300	PV	0.045	12 [illegible]
0.83	431700	D VB	0.095	15 [illegible]
1.39	0	BB	0.000	0 [illegible]
TCA 2.78	1972	BB	0.097	0 [illegible]
TLL 3.97	26120	PB	0.161	0 [illegible]
KC 9.63	33922	BB	0.383	1 [illegible]

TOTAL AREA= 823020

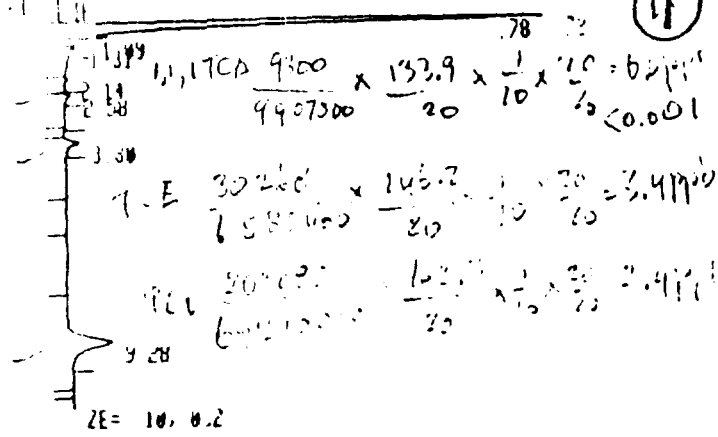
Lab # 7-02-10-113

MAR 21 1987

MUL FACTOR= 3.0000E-01

7-455-4
Phenol 115
→10 λ

LIST: ZERO = 10, 0.1



ZE= 10, 0.2

STOP

RUN # 166 FEB/12/87 14:42 14

AREA% RT	AREA	TYPE	AR/HT	AREA%
0.72	279350	PV	0.040	2 117
1.78	682100	VB	0.099	15 985
1.09	1580	BP	0.026	0 [illegible]
1.31	0	PB	0.000	0 [illegible]
2.14	4203	BB	0.095	0 [illegible]
2.58	9380	BB	0.102	0 [illegible]
3.80	30268	PB	0.159	0 [illegible]
9.28	203880	PB	0.342	5 [illegible]

TOTAL AREA= 1130000
MUL FACTOR= 3.0000E-01

Lab # 7-02-10-115

MUL FACTOR= 3 [illegible]E-01

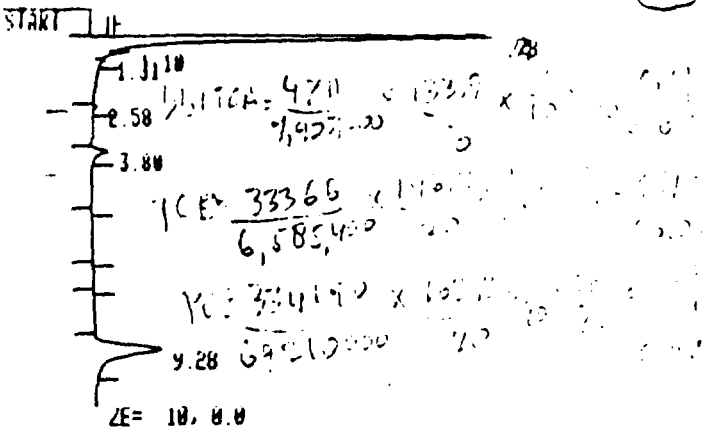
8 feet Way up 2nd → 3

7-0455-3
Phenol #114
>10

LIST: ZERO = 10,-0.1

LIST: ZERO = 10, 0.0

LIST: ZERO = 10, 0.0



ZE= 10, 0.0

STOP

RUN # 164 FEB/12/87 14:12 50

AREA% RT	AREA	TYPE	AR/HT	AREA%
0.72	221370	PV	0.039	5 914
0.78	655600	VV	0.112	14 [illegible]
1.10	58824	VV	0.117	1 332
1.31	16374	VB	0.126	0 [illegible]
2.58	4711	BB	0.100	0 [illegible]
3.80	33366	PB	0.156	0 [illegible]
9.28	334190	PB	0.352	7 570

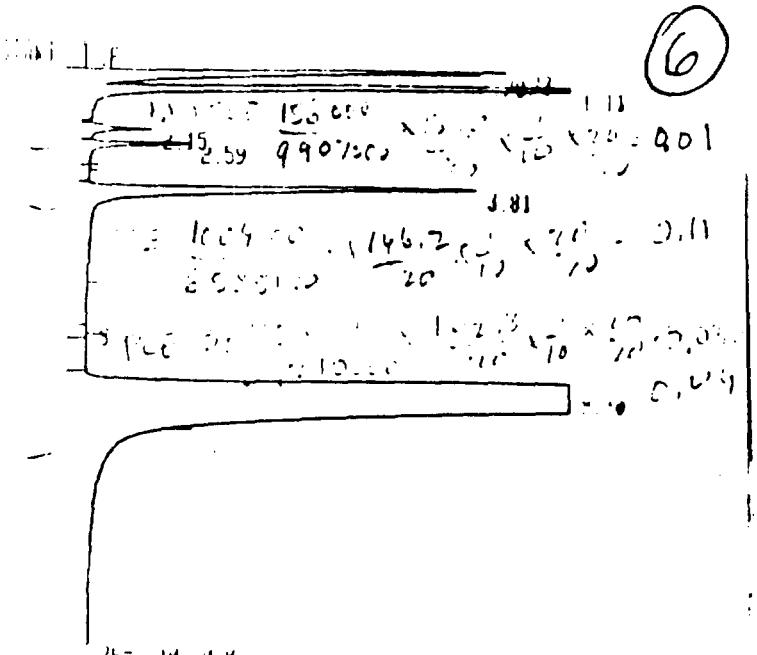
TOTAL AREA= 1324400

Lab # 7-02-10-114

FACTOR= 3.0000E-01

20/40

7-0455-6 Fraction 117 → 101



ZE= 10, 4.0

STOP

RUN # 168 FEB/12/87 15:19:55

AREA%

RT	AREA	TYPE	AR/HT	AREA%
0.73	239060	PV	0.040	0.189
0.78	627160	VH	0.111	0.496
1.11	4956700	SHB	0.066	3.921
2.15	88832	TVV	0.103	0.070
2.59	156000	TVP	0.110	0.123
3.81	1004100	TBB	0.180	0.794
9.30	3.0853E+07	PB	0.392	24.406

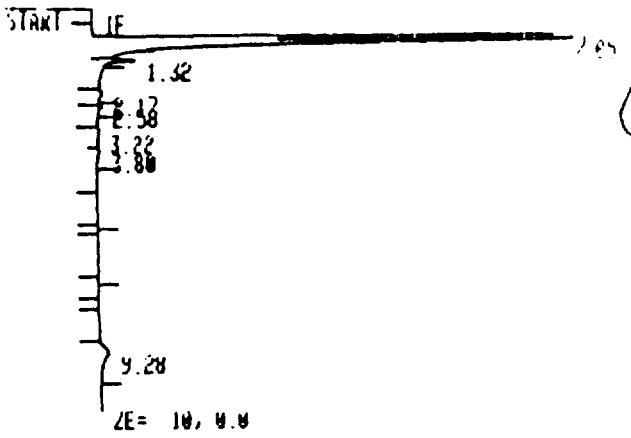
TOTAL AREA= 3.7925E+07

Inf # 7-02-10-117

20/40

7-0455-5 Fraction 116 → 510

LIST: ZERO = 10, 0.0



ZE= 10, 0.0

STOP

RUN # 167 FEB/12/87 15:06:37

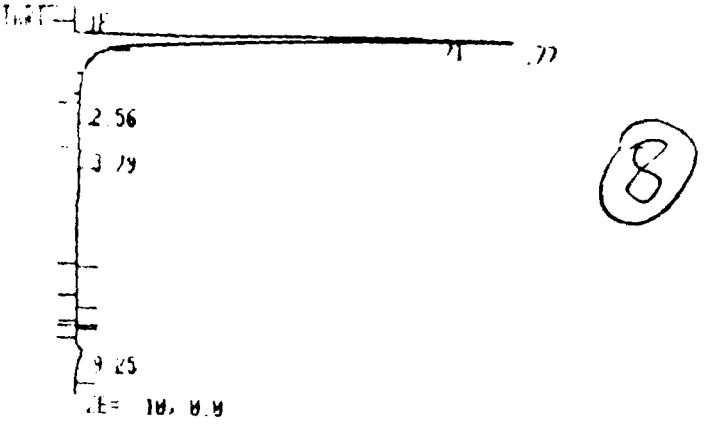
AREA%

RT	AREA	TYPE	AR/HT	AREA%
0.73	391460	PV	0.061	0.309
0.85	751570	VB	0.088	0.593
1.32	23656	BB	0.065	0.019
2.17	4526	BB	0.105	0.004
2.58	5146	BB	0.097	0.004
3.22	4010	BP	0.206	0.003
3.80	5821	PB	0.150	0.005
9.28	45662	BB	0.364	0.036

TOTAL AREA= 1231900

Inf # 7-02-10-116

LIST: ZERO = 10,-0.1



(8)

STOP

RUN # 170 FEB/12/87 16:35:1M

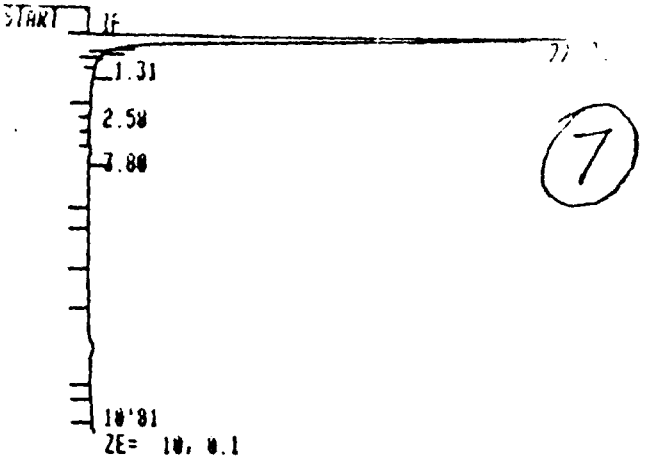
AREA%

RT	AREA	TYPE	AR/HT	AR%
0.71	157240	BV	0.033	5.102
0.77	673270	VB	0.111	23.733
2.56	376	BB	0.042	0.013
3.79	4025	BB	0.154	0.142
9.25	29656	PB	0.373	0.995

TOTAL AREA= 863630

Lot # 7-02-10-119

LIST: ZERO = 10, 0.0



(7)

STOP

RUN # 169 FEB/12/87 15:3[illegible]

AREA%

RT	AREA	TYPE	AR/HT	AR%
0.72	269720	PV	0.039	9.[illegible]
0.77	605330	VB	0.097	20.922
1.31	0	BP	0.000	0.000
2.58	1465	BP	0.095	0.050
3.80	4096	PB	0.152	0.140

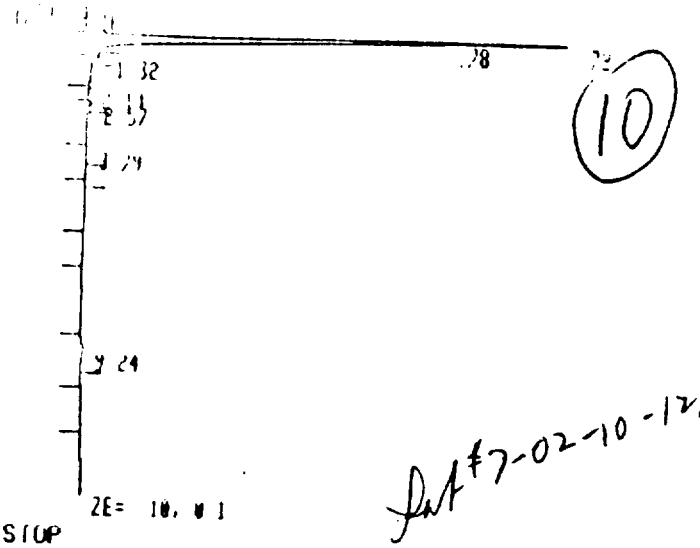
TOTAL AREA= 880610
MULTIPLICATION FACTOR= 3.000000E-01

Lot # 7-02-10-118

20/40

7-04 Area - 121 → 10λ

LIST: ZERO = 10, 0.0



STOP

Lot # 7-02-10-121

RUN # 172 FEB/12/87 17:03:04

AREA%

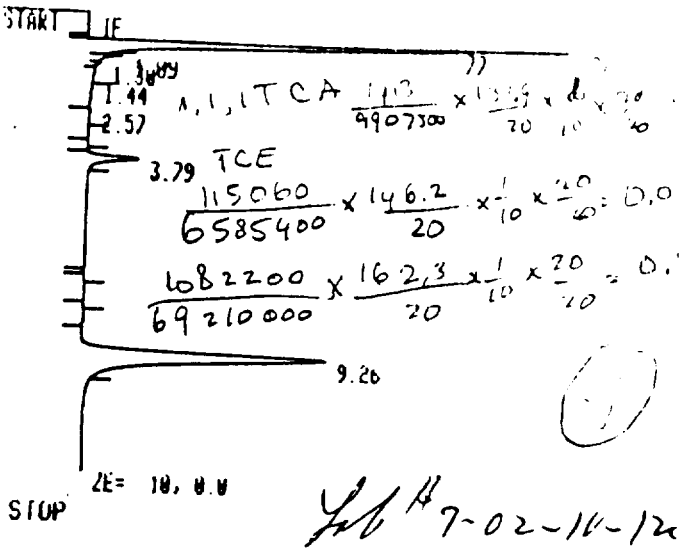
RT	AREA	TYPE	AR/HT	AREA%
.72	342180	PV	0.043	11 .525
0.78	485490	D VB	0.094	17 .914
1.32	5962	BB	0.056	0 .209
2.14	758	BP	0.089	0 .027
2.57	6886	PB	0.103	0 .241
3.79	2728	BB	0.160	0 .096
9.24	12022	PB	0.361	0 .421

TOTAL AREA= 856020

20/40

Area - 121 → 10

LIST: ZERO = 10, 0.0



STOP

Lot # 7-02-10-121

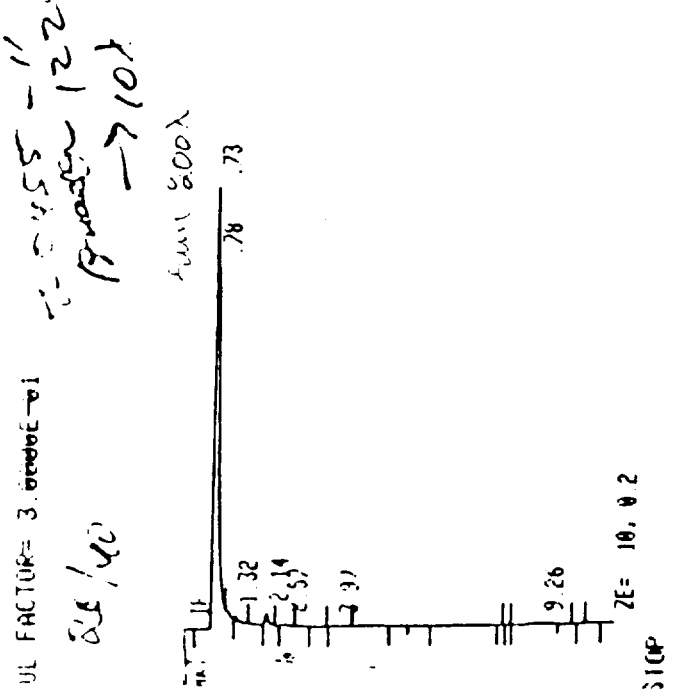
RUN # 171 FEB/12/87 16:47:38

AREA%

RT	AREA	TYPE	AR/HT	AREA%
0.72	314760	PV	0.042	4 .861
0.77	448030	D VB	0.089	6 .772
1.09	8065	BV	0.042	0 .122
1.30	5009	VP	0.154	0 .076
1.44	8648	PB	0.165	0 .131
TCA 2.57	1413	BB	0.089	0 .021
TCE 3.79	115060	PB	0.160	1 .741
9.26	1082200	PB	0.314	16 .371

TOTAL AREA= 1983200

MUL FACTOR= 3.00000E-01



STOP

RUN # 173 FEB/12/87 17:17:42

AREA%

RT	AREA	TYPE	AR/HT	AREA%
0.73	213630	PV	0.035	9 .354
0.78	447910	VB	0.090	19 .612
1.32	0	BB	0.000	0 .000
2.14	15664	BB	0.093	0 .686
2.57	1562	BB	0.088	0 .068
3.97	1366	BB	0.175	0 .060
9.26	5021	PV	0.362	0 .220

TOTAL AREA= 685150

MUL FACTOR= 3.00000E-01

Lot # 7-02-10-122

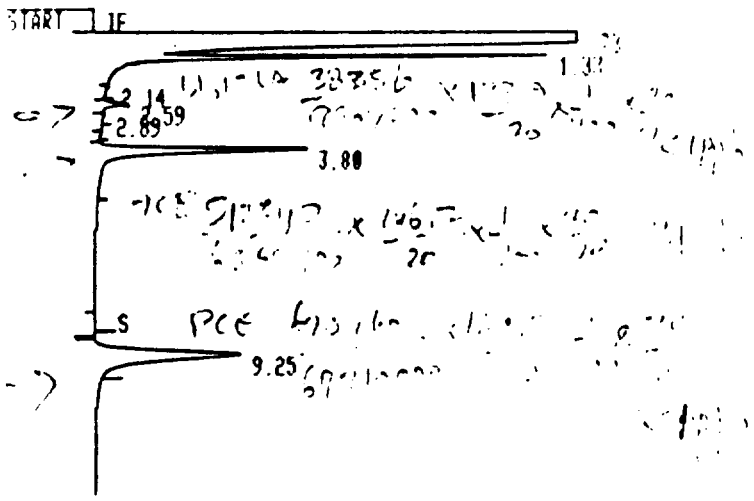
2/12

7-0455-2

#113 -113 200µL ml

(2)

DUPLICATE Injection 200µL



Lab # 7-02-10-11 Duplicate

RUN # 182 FEB/12/87 19:58:15

AREA%

	RT		AREA	TYPE	AR/HT	AREA%
	0.73		2.3836E+07	SPB	0.083	2[illegible]
	1.33		419060	TBB	0.075	0.[illegible]
	2.14		1867	TBP	0.087	0
TCA	2.59	-	38356	TPV	0.106	0
	2.89		3750	TVV	0.131	0
TCE	3.80		512340	TPB	0.172	0
PCE	9.25		625260	PB	0.308	0

TOTAL AREA= 2.5437E+07
MUL FACTOR= 3.0000E-01

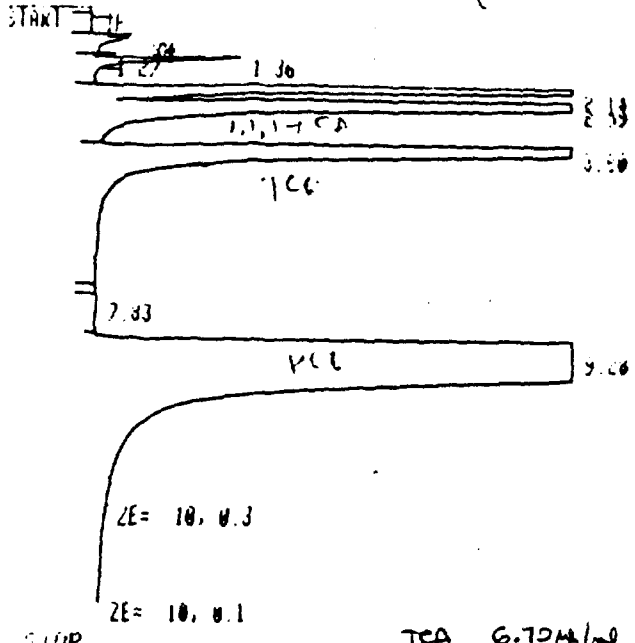
MUL FACTOR= 3.00000E-01

STD 8010 2/12

20/40 water spike 10λ Injection → 1λ

STANDARD

LIST: ZERO = 10, 0.0



STOP

TCA 6.70 µg/ml
TCE 7.31 µg/ml
PCE 8.12 µg/ml

1µL Injection

RUN # 165 FEB/12/87 14:24:58

AREA%

	RT	AREA	TYPE	AR/HT	AREA%
	0.73	28292	PV	0.050	0.010
	0.80	80817	VB	0.156	0.027
	1.27	3885	PV	0.041	0.001
	1.36	210548	VB	0.101	0.071
	2.14	3067500	PB	0.108	1.033
TCA	2.59	9907500	PB	0.121	3.336
TCE	3.80	6585400	PB	0.174	2.217
	7.83	1429	BP	0.167	4.8117E-04
PCE	9.28	6.9210E+07	PB	0.394	23.304

APPENDIX B
BROWN AND CALDWELL
SITE INVESTIGATION REPORT

June 9, 1987

Mr. Charles M. Miller
Monadnock Company
18301 East Arenth Avenue
City of Industry, California 91749

12-3263-01

Subject: Site Investigation of the Monadnock Company Property, City of Industry, California

Dear Mr. Miller:

This letter report describes Brown and Caldwell's activities at the Monadnock Company property located at 18301 East Arenth Avenue, in the City of Industry, California. This investigation was performed, at your request, to determine if any solvent constituents had migrated on-site from the neighboring property and further define the distribution of solvent constituents in the soil and groundwater along the western property line. In addition, the investigation included determining if soil was contaminated in a former drum storage area.

A previous investigation was performed by Dames & Moore in August 1986. Mr. Ralph Wagner, another consultant, did additional studies and prepared a report "Site Assessment Evaluation and Proposed Remedial Action Plan", dated 20 October 1986.

Fieldwork, subsurface geology, analytical results and conclusions are described below.

Fieldwork

In addition to work previously performed by Dames and Moore which consisted of installing three groundwater monitoring wells, and sampling six soil borings, Brown and Caldwell installed three groundwater monitoring wells, BC-2, BC-3 and BC-5, and two soil borings BC-1 and BC-4. The location of these wells and borings are shown on Figure 1.

The groundwater monitoring wells were installed using a truck-mounted Mobile B-61 drill rig equipped with continuous flight hollow-stem augers. The augers were steam cleaned between each boring to avoid cross-contamination.

Soil samples were collected at 5 foot intervals to groundwater from borings BC-1 and BC-4 and well borings BC-2 and BC-3. Only two soil samples were collected from BC-5. All samples were collected using a California Modified Sampler. Due to a

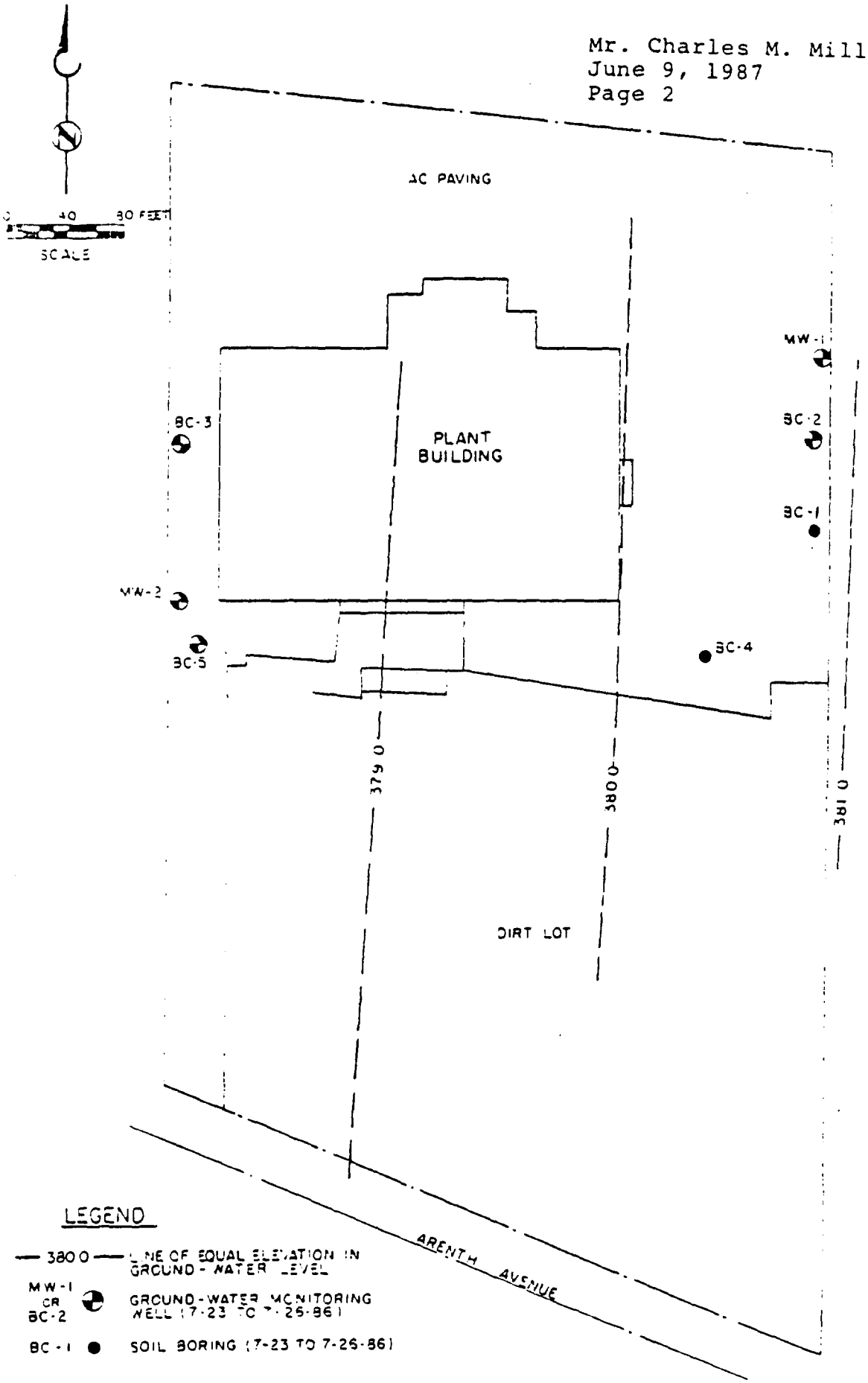


Figure 1 Site Plan

limited scope of work, not all the wells were sampled due to time and budgetary. Samples were collected using clean brass tubes. The ends were sealed with foil, capped with plastic caps, wrapped in plastic tape, labeled, and chilled in an ice chest for transport to the Brown and Caldwell laboratory.

Of the two soil borings, BC-1 was sampled to a total depth of 40 feet and BC-4 was sampled to 21.5 feet. These borings were then backfilled with cement grout to grade.

Three monitoring wells were installed: one on the east side and two on the west side of the plant building to determine the direction of groundwater flow. Water was encountered at approximately 39 feet. Therefore, the borings were drilled to a depth of approximately 60 feet. These wells were constructed of 4-inch diameter flush threaded schedule 40 polyvinyl chloride (PVC) with 0.01 inch slotted screen extending at least 10 feet above the water table and 20 feet below. The filter pack material used to surround the screened section was clean No. 2/12 Lonestar sand. The 0.01-inch screen size and the No. 2/12 sand pack were chosen in order to reduce the production of solids from the well. A minimum two-foot bentonite seal was placed above the filter pack and the remaining annular space was backfield with cement grout. Figure 2 shows the typical monitoring well construction.

The wells were developed by the bail and surge method using a 3.85-inch PVC bailer. An Isco bladder pump was then used to evacuate approximately three well volumes before the wells were sampled. The wells were then sampled using a teflon bailer. Both the PVC and the teflon bailer were cleaned with a steam cleaner between each well to avoid cross-contamination.

Site Soil Characteristics

The subsurface soils encountered during drilling consisted of alternating beds of brown silty clays of moderate plasticity, clayey and silty fine grained sand with some coarse grain to gravelly sand, and gravels found at the 20 to 30 foot depths. In well BC-3, at the 21.5 foot depth, a slightly oily layer was encountered. The subsurface soil conditions are summarized on the boring logs in Attachment A.

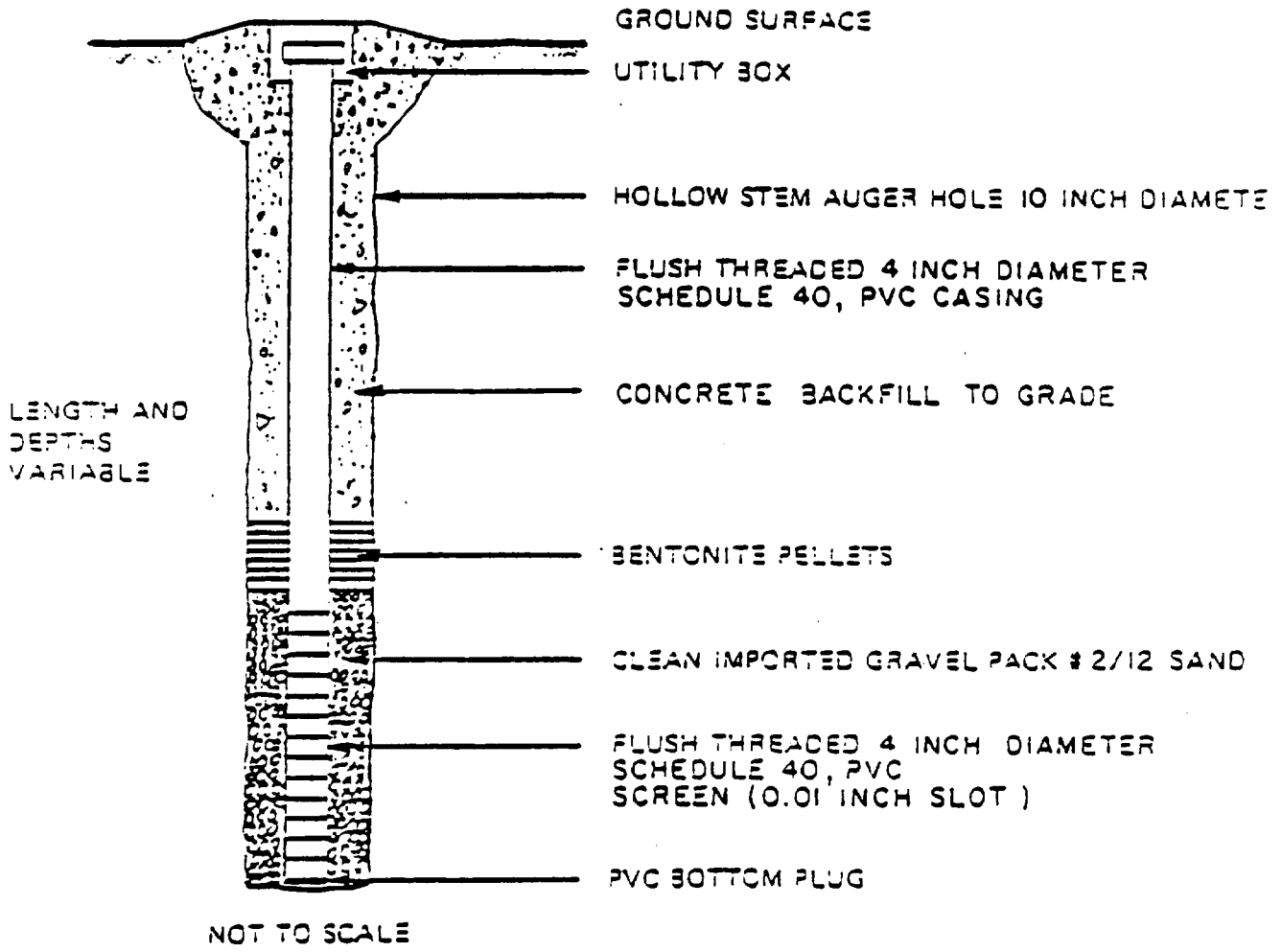


Figure 2 Monitoring Well Construction

Analytical Results

Laboratory analyses were conducted on a composite of all soil samples from soil boring BC-4, and on one discrete soil sample from boring BC-5. These were the only samples analyzed due to the limited scope of work. These samples were analyzed using EPA Test Method 8240 for purgeable priority pollutants. Results from this analysis for boring BC-4 and Well BC-5 samples indicate concentrations below detectable limits in all priority pollutant constituents.

Laboratory analyses were also conducted on groundwater samples collected from Wells BC-2, BC-3 and BC-5. These samples were analyzed using EPA Test Method 601 for purgeable halocarbons. Results from the analysis indicate that in Well BC-2, all purgeable halocarbon constituents are below detectable limits except for tetrachloroethene (PCE), 1,1,1- trichloroethane (TCA), and trichloroethylene (TCE). These constituents are present in concentrations below the California Department of Health Services (DOHS) action levels for contaminants in drinking water.

Results for analyses of groundwater samples for Well BC-3 indicate that the concentrations of 1,1-dichloroethene, trichlorethylene (TCE) and tetrachloroethene (PCE) are above DOHS action levels.

In Well BC-5, the halocarbon constituents 1,1 - dichloroethene, 1,2- dichloroethane, dibromochloromethane, tetrachloroethene (PCE), and trichlorocthylene (TCE) are above DOHS action levels for drinking water. All other purgeable halocarbon constituents were either present in concentrations below DOHS action levels or not detected.

Table 1 summarizes findings from the analyses on groundwater from Wells BC-2, BC-3, and BC-5. Analytical results for soil and groundwater are summarized in Attachment B.

Table 1. Analytical Results of Groundwater Samples

Constituent	Concentration Present (ug/l) Well BC-2	Well BC-3	Well BC-5	DOHS action level (ug/l)
1,1 - Dichloroethane	<0.5	5	6	20
1,1 - Dichloroethylene	<0.5	40	110	6
1,2 - Dichloroethane	<0.5	0.7	5	6
Dibromochloromethane	<0.5	<0.5	10	None
Tetrachloroethene (PCE)	1.8	33	110	4
1,1,1-trichloroethane (TCA)	0.5	3	38	200
Trichloroethylene (TCE)	0.5	91	180	4

ug/l - micrograms per liter.

Conclusions

This investigation was initiated at your request to determine if any migration of contamination of solvents had occurred from off-site sources onto the Monadnock Company property.

Groundwater flow direction was determined to be east to west. Results of the analysis performed on the groundwater sample extracted for the upgradient Well, BC-2, indicate that concentrations of contamination were below detectable levels or below action level for drinking water. This indicates that solvents are apparently not migrating onto the site from the east.

Analysis of groundwater from Wells BC-3 and BC-5, and sample analyses given in Ralph Wagner's October 1987 report indicates the presence of solvents in the groundwater, along the western boundary of the Monadnock property. This infers that the source is the area at the south west corner of the plant building. The area has already been defined in previous studies and is also discussed in Ralph Wagner's October 1986 report.

In addition, the soil boring, BC-4, drilled in the former drum storage area indicated no detectable soil contamination. We trust that this letter report meets your requirements at this time. If you should have any questions, please contact me at (818) 577-1020.

Very truly yours,

BROWN AND CALDWELL

REGISTERED GEOLOGIST
VIJAY KUMAR BEDI
No. EG 1247
CERTIFIED ENGINEERING GEOLOGIST
Exp. 6/30/88
STATE OF CALIFORNIA

Vijay K. Bedi, C.E.G.
Supervisor, Hazardous Materials Management Department

KA:VKB:em

ATTACHMENT A

Boring Logs

Brown and Caldwell

BORING LOG

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC1 Sheet 1 of 2

Boring Location:		Elevation and Datum:	
Drilling Contractor: A & R Drilling	Driller: Craig Stelbach	Date Started: 3/23/87	Date Finished: 3/23/87
Drilling Equipment: Mobile B61	Borehole Diameter: 10"	Completed Depth: (feet) 41	Water Depth: (feet) -
Sampling Method: California Modified ☒ Shelby Tube ☐ Split Spoon ☐		WELL CONSTRUCTION	
Drilling Fluid: none		Type and Diameter of Well Casing: NA	
Backfill Material: cement		Slot Size: NA	Filter Material: NA
Logged By: Karl J. Anania	Checked By: V. Bedi	Development Method: NA	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
	GW	Asphalt: black							
	GM	Subbase: Brown gravel and silt							
	SC	Clayey sand: Dark brown, dry moderately plastic.							
	CH	Clay: brown, moist, high plasticity, very stiff							
5	CL	Clay: Dark brown, low plasticity, trace gravel, very stiff.	10 13 12	A					
		Silty clay: Brown, moist, low plasticity, very stiff							
10	CL		6 6 7	B					
	ML	Silty clayey sand; light brown, dry with silt and clay, medium dense							
15	CL	Clay: Brown, dry, low plasticity, minor silt, very stiff	5 10 14	C					
	SM	Silty clayey sand: light brown, dry fine, with silt and clay, medium dense							
	CL								
20		Clay: Brown, moderately plastic, very stiff	7 11 14	D					
25	CL	Silty clay: Brown, moist, moderately plastic, very stiff							
	GC	Clayey Gravel: Light brown, moist decomposing gravel in clay matrix, medium dense							
	CL	Clay: Brown, moist/wet, moderately plastic, very stiff							
30			8 11 14	E					

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring [X] Monitoring Well [ ] Boring/Well Number: BC1 Sheet 2 of 2

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
35	CL	Clay: as above							
40		Bottom of boring 41 feet	12 15 20	F					
45									
50									
55									
60									
65									
70									

BROWN AND CALDWELL

SOUTH ARROYO PARKWAY • P.O. BOX 7103 PASADENA, CA 91109 (818) 577-1400 (714) 971-0504

Brown and Caldwell

Brown and Caldwell

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring ☐ Monitoring Well ☒ Boring/Well Number: BC2 Sheet 1 of 2

Boring Location: East of building		Elevation and Datum	
Drilling Contractor: A&R	Driller: Craig Stelbach	Date Started: 3/23/87	Date Finished: 3/27/87
Drilling Equipment: Mobile B-61	Borehole Diameter: 10"	Completed Depth (feet): 62	Water Depth (feet): -
Sampling Method: California Modified ☒ Shelby Tube ☐ Split Spoon ☐		WELL CONSTRUCTION	
Drilling Fluid: None		Type and Diameter of Well Casing: 4" sch. 40 PVC	
Backfill Material: Cement		Slot Size: 0.01"	Filter Material: #2/12 lone star
Logged By: Karl Anania	Checked By: V. Bedi	Development Method: Bailing	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
	GW	Asphalt: Black							
	GW	Gravel Subbase: Brown							
		Clay: Brown slightly moist, moderately plastic, firm.							
5	CL	Clayey sand (fill), light brown with gray mottling, dry, fine sand in clay matrix, medium dense	5 7 12						
10	SC		6 12 13						
15			5 6 4						
	GC	Clayey gravel, brown, dry, medium dense clay, dry, low plasticity, stiff							
20	CL		6 9 8						
25	GC	Clayey gravel: Brown, dry, very dense	32 50						
	CL	Clay: Brown, moist, low plasticity, minor silt, very stiff.							
30			31 11 13						

BORING LOG

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring ☐ Monitoring Well ☒ Boring/Well Number: BC-2 Sheet 2 of 2

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
35	GC CL	Clayey Gravel: Brown, dry, medium dense Clay: Brown, moist, low plasticity, hard	8 21 35						
40	SM	Silty sand, brown, wet, well graded very coarse-grained, some pebbles, medium dense	7 9 15						
60		Bottom of boring 62 feet							Natural sand

BROWN AND CALDWELL

(714) 444-8441 • P.O. Box 7103 PASADENA, CA 91109 (818) 577-1400 (714) 327-0504

Brown and Caldwell

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring ☐ Monitoring Well ☒ Boring/Well Number: BC3 Sheet 1 of 2

Boring Location: West of Building		Elevation and Datum:	
Drilling Contractor: A&R Drilling	Driller: C. Stelbach	Date Started: 3/24/87	Date Finished: 3/25/87
Drilling Equipment: Mobile B-61	Borehole Diameter: 10"	Completed Depth (feet): 60	Water Depth (feet): 39.5
Sampling Method: California Modified ☒ Shelby Tube ☐ Split Spoon ☐		WELL CONSTRUCTION	
Drilling Fluid: none		Type and Diameter of Well Casing: 4" Sch 40 PVC	
Backfill Material: cement		Slot Size: 0.01"	Filter Material: #2/12 Lone Star
Logged By: K. Anania/ L. Maserjizn	Checked By: V. Bedi	Development Method: Bailing	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
5	CL	Clay: Dark brown dry, moderately plastic trace coarse sand, stiff to very stiff	4 5 8	A					
10			6 12 18	B					
15	SW	Sand, Brown, dry, well-graded, very dense	15 57/5"						
20		Becomes coarser to very coarse-grained trace oil, some rock fragments. 1/2-1-1/2" long.	17 32 50						Oil residue on 21-21-1/2 foot sample.
25		Color change to reddish-brown, coarse-grained	24 28 21						
30	CL	Silty clay, grayish-brown, low plasticity, stiff	8						

BROWN AND CALDWELL

Project Name: The Manadnock Company Project Number: 3263-01

Soil Boring ☐ Monitoring Well ☒ Boring/Well Number: BC3 Sheet 2 of 2

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
35	CL	Clay: as above Becomes very hard, trace organic matter.	18 21 25						Water around 39.5
40	SM	Silty sand, brown, wet, well graded very coarse grained, some pebbles, dense							
45									
50									
55									Natural sands
60		Bottom of boring 60 feet.							
65									
70									

BROWN AND CALDWELL

Brown and Caldwell

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring [X] Monitoring Well [ ] Boring/Well Number: BC-4 Sheet 1 of 1

Boring Location: South of building		Elevation and Datum:	
Drilling Contractor: A&R	Driller: Craig Stelbach	Date Started: 3/24/87	Date Finished: 3/24/87
Drilling Equipment: Mobile B-61	Borehole Diameter: 8"	Completed Depth: (feet) 20	Water Depth: (feet) -
Sampling Method: California Modified [X] Shelby Tube [ ] Split Spoon [ ]		WELL CONSTRUCTION	
Drilling Fluid: None		Type and Diameter of Well Casing: NA	
Backfill Material: cement		Slot Size: NA	Filter Material: NA
Logged By: L. Maserjian	Checked By: V. Bedi	Development Method: NA	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
	ML	Clayey silt, dark brown, dry, slightly plastic, trace coarse sand, stiff							
5	SM	Silty sand, light reddish-brown, dry, very fine grained, some pebbles, medium dense	7 7 8	1					
10	ML	Clayey-silt, Dark brown, dry, low plasticity, very stiff	5 7 10	2					
	CL	Silty clay, dark grayish-brown, dry too plasticity, very stiff							
15	CL		5 6 10	3					
20	SW	Sand, reddish brown, moist, well graded, very fine grained, dense.	10 15 25	4					
25		Bottom of boring 21.5 ft.							
30									

BROWN AND CALDWELL

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring ☐ Monitoring Well ☒ Boring/Well Number: BC5 Sheet 1 of 2

Boring Location: Southwest Corner of Building		Elevation and Datum:	
Drilling Contractor: A&R	Driller: Craig Stelbach	Date Started: 3/24/87	Date Finished: 3/24/87
Drilling Equipment: Mobile B-16	Borehole Diameter: 10"	Completed Depth (feet): 60	Water Depth (feet): 40
Sampling Method: California Modified ☐ Shelby Tube ☐ Split Spoon ☐		WELL CONSTRUCTION	
Drilling Fluid: none		Type and Diameter of Well Casing: 4" Schedule 40 PVC	
Backfill Material: cement		Slot Size: 0.01"	Filter Material: 2/12 Lone Star
Logged By: L. Maserjian	Checked By: V. Bedi	Development Method: Bailing	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
0	CH	Clay-Black, dry, highly plastic, trace sands, odor.							
		Becoming dark brown loose, odor							
5		Becomes gray-brown, increasing sand, fine to medium grained.							
		Becomes brown, trace sand, trace pebbles							
10		Becomes more pebbley, some sand, brown							
15	GW	Sandy gravel, dark brown, dry, mostly pea-gravel, some pebbles, trace cobbles							
	SW	Becomes very coarse pebbley sand, some pebbles, trace cobbles coarse graded sand, trace silt							
20									
25	GW	Increasing gravels, cobbles, pure gravel at 24' avg 1" diameter							
		Sandy gravel at 25' gravel grains larger than 1-1/2".							
		Increasing cobbles pure gravels at 28, some cobbles decreasing size to mostly gravel,							
30									

PARKWAY • PO BOX 7103 PASADENA CA 91109 (818) 577 1020 (714) 971-0504

Project Name: The Monadnock Company Project Number: 3263-01

Soil Boring ☐ Monitoring Well ☒ Boring/Well Number: BC-5 Sheet 2 of 2

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings	Remarks
35	CL	Sandy silty clay, dark brown, moist, very plastic, coarse sands.							2 samples at 38-29-1/2 1 for permeability
40	SM	Silty sand, brown, wet, well graded, very coarse grained, some pebbles							
45									
50									
55									
60		Bottom of Boring 60 feet							Natural sand
65									
70									

BROWN AND CALDWELL

ATTACHMENT B

Analytical Results and Chain of Custody

SOUTH ARROYO PARKWAY • P.O. BOX 7103 PASADENA, CA 91109 (818) 577-1020 (714) 971-0504

Client name: Brc & Caldwell

Job number: 3263-01

Project name: Monadnock

Project manager: K. Anania

Sampler(s): R. Hastings

Sample number	Date sampled	Time sampled	Type Composite or Grab	Sample description	Number of containers	Analyses required: 601	Hazardous sample / Special handling required	Remarks
1	3-30	AM	G	SW Sample BC-2	1	X		
2	3-30	AM	G	" BC-5	1	X		
3	3-30	PM	G	" BC-3	1	X		

	Signature	Company	Date	Time
Relinquished by	[signature]	Brown & Caldwell	3-30-87	3:
Received by	Ron McLa	B & C	3 30 87	3:
Relinquished by				
Received by				
Relinquished by				
Received by				

BROWN AND CALDWELL

BROWN AND CALDWELL Analytical Laboratories

☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428 2300

Note: Samples are discarded 30 days after results are reported unless other arrangements are made.

Hazardous samples will be returned to client ... posed

BROWN AND CALDWELL LABORATORIES
373 SOUTH FAIR OAKS AVENUE PASADENA CA 91105 • (818) 795-7553

ANALYTICAL REPORT

LOG NO: P87-03-504

Received: 30 MAR 87
Reported: 13 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
03-504-1	BC-2	30 MAR 87
03-504-2	BC-3	30 MAR 87
03-504-3	BC-5	30 MAR 87

PARAMETER	03-504-1	03-504-2	03-504-3
Halocarbons (EPA 601)			
Date Extracted	04/02/87	04/02/87	04/02/87
Dilution Factor, Times 1	1	1	1
1,1,2,2-Tetrachloroethane, ug/L	<0.5	<0.5	<0.5
1,1,2-Trichloroethane, ug/L	<0.5	<0.5	<0.5
1,1-Dichloroethane, ug/L	<0.5	5	6
1,1-Dichloroethene, ug/L	<0.5	40	110
1,2-Dichlorobenzene, ug/L	<0.5	<0.5	<0.5
1,2-Dichloroethane, ug/L	<0.5	0.7	5
trans-1,2-Dichloroethene, ug/L	<0.5	1.5	2
1,2-Dichloropropane, ug/L	<0.5	<0.5	<0.5
1,3-Dichlorobenzene, ug/L	<0.5	<0.5	<0.5
1,4-Dichlorobenzene, ug/L	<0.5	<0.5	<0.5
2-Chloroethylvinylether, ug/L	<0.5	<0.5	<0.5
Bromodichloromethane, ug/L	<0.5	<0.5	<0.5
Bromomethane, ug/L	<0.5	<0.5	<0.5
Bromoform, ug/L	<0.5	<0.5	<0.5
Chlorobenzene, ug/L	<0.5	<0.5	<0.5
Carbon Tetrachloride, ug/L	<0.5	<0.5	<0.5
Chloroethane, ug/L	<0.5	<0.5	<0.5
Chloroform, ug/L	<0.5	0.8	1.6
Chloromethane, ug/L	<0.5	<0.5	<0.5
Dibromochloromethane, ug/L	<0.5	<0.5	10
Dichlorodifluoromethane, ug/L	<0.5	<0.5	<0.5
Methylene chloride, ug/L	<2	<2	<2

BROWN AND CALDWELL LABORATORIES
373 SOUTH FAIR OAKS AVENUE PASADENA CA 91105 • (818) 795-7553

ANALYTICAL REPORT

LOG NO: PB7-03-504

Received: 30 MAR 87
Reported: 13 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
03-504-1	BC-2	30 MAR 87
03-504-2	BC-3	30 MAR 87
03-504-3	BC-5	30 MAR 87

PARAMETER	03-504-1	03-504-2	03-504-3
Tetrachloroethene, ug/L	1.8	33	110
1,1,1-Trichloroethane, ug/L	0.5	3	38
Trichloroethylene, ug/L	0.5	91	180
Trichlorofluoromethane, ug/L	<0.5	<0.5	<0.5
Vinyl chloride, ug/L	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene, ug/L	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene, ug/L	<0.5	<0.5	<0.5

Edward Wilson, Laboratory Director

BROWN AND CALDWELL LABORATORIES
373 SOUTH FAIR OAKS AVENUE PASADENA CA 91105 • (818) 795-7553

ANALYTICAL REPORT

LOG NO: P87-03-507

Received: 31 MAR 87
Reported: 14 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-507-1	Comp. BC4-(5,10,15,20')	24 MAR 87
03-507-2	BC5-38'	24 MAR 87
03-507-3	BC4-5'	24 MAR 87
03-507-4	BC4-10'	24 MAR 87
03-507-5	BC4-15'	24 MAR 87

PARAMETER	03-507-1	03-507-2	03-507-3	03-507-4	03-507-5
Sample Held, Not Analyzed	---	---	HOLD	HOLD	HOLD

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ANALYTICAL REPORT

LOG NO: P87-03-507

Received: 31 MAR 87
Reported: 14 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-507-1	Comp. BC4-(5,10,15,20')	24 MAR 87
03-507-2	BC5-38'	24 MAR 87
03-507-3	BC4-5'	24 MAR 87
03-507-4	BC4-10'	24 MAR 87
03-507-5	BC4-15'	24 MAR 87

AMETER	03-507-1	03-507-2	03-507-3	03-507-4	03-507-5
Purgeable Priority Pollutants					
Extraction	04/06/87	04/06/87	---	---	---
Dilution Factor, Times 1	1	1	---	---	---
1,1,1-Trichloroethane, mg/kg	<0.3	<0.3	---	---	---
1,1,2,2-Tetrachloroethane, mg/kg	<0.3	<0.3	---	---	---
1,1,2-Trichloroethane, mg/kg	<0.3	<0.3	---	---	---
1,1-Dichloroethane, mg/kg	<0.3	<0.3	---	---	---
1,1-Dichloroethylene, mg/kg	<0.3	<0.3	---	---	---
1,2-Dichloroethane, mg/kg	<0.3	<0.3	---	---	---
1,2-Dichloropropane, mg/kg	<0.3	<0.3	---	---	---
1,3-Dichloropropene, mg/kg	<0.3	<0.3	---	---	---
2-Chloroethylvinylether, mg/kg	<0.3	<0.3	---	---	---
Acrolein, mg/kg	<3	<3	---	---	---
Acrylonitrile, mg/kg	<3	<3	---	---	---
Bromodichloromethane, mg/kg	<0.3	<0.3	---	---	---
Bromomethane, mg/kg	<0.3	<0.3	---	---	---
Benzene, mg/kg	<0.3	<0.3	---	---	---
Chlorobenzene, mg/kg	<0.3	<0.3	---	---	---
Carbon Tetrachloride, mg/kg	<0.3	<0.3	---	---	---
Chloroethane, mg/kg	<0.3	<0.3	---	---	---
Bromoform, mg/kg	<0.3	<0.3	---	---	---
Chloroform, mg/kg	<0.3	<0.3	---	---	---
Chloromethane, mg/kg	<0.3	<0.3	---	---	---

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ANALYTICAL REPORT

LOG NO: P87-03-507

Received: 31 MAR 87
Reported: 14 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-507-1	Comp. BC4-(5,10,15,20')	24 MAR 87
03-507-2	BC5-38'	24 MAR 87
03-507-3	BC4-5'	24 MAR 87
03-507-4	BC4-10'	24 MAR 87
03-507-5	BC4-15'	24 MAR 87

PARAMETER	03-507-1	03-507-2	03-507-3	03-507-4	03-507-5
Dibromochloromethane, mg/kg	<0.3	<0.3	---	---	---
Ethylbenzene, mg/kg	<0.3	<0.3	---	---	---
Methylene Chloride, mg/kg	<0.3	<0.3	---	---	---
Tetrachloroethylene, mg/kg	<0.3	<0.3	---	---	---
Trichloroethylene, mg/kg	<0.3	<0.3	---	---	---
Trichlorofluoromethane, mg/kg	<0.3	<0.3	---	---	---
Toluene, mg/kg	<0.3	<0.3	---	---	---
Vinyl Chloride, mg/kg	<0.3	<0.3	---	---	---
trans-1,2-Dichloroethylene, mg/kg	<0.3	<0.3	---	---	---
trans-1,3-Dichloropropene, mg/kg	<0.3	<0.3	---	---	---

BROWN AND CALDWELL LABORATORIES
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ANALYTICAL REPORT

LOG NO: P87-03-507

Received: 31 MAR 87
Reported: 14 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-507-6	BC4-20'	24 MAR 87

PARAMETER	03-507-6
Sample Held, Not Analyzed	HOLD

Robert Peak for
Edward Wilson, Laboratory Director

APPENDIX C
MONITORING WELL TEST RESULTS

The Monadnock Co.
18301 East Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

November 21, 1986

LAB NO. 6-11-12-647
PERMIT NO. .....

SAMPLE TYPE: Liquid Ex Pump

SAMPLE POINT: MW-2

FLOW RATE: .....

TIME: Sample Received: 11/12/86

		Analysis
TCE	.....	0.15 mg/L
PCE	.....	0.02 mg/L
1,1,1 TCA	.....	0.04 mg/L

Clifford J. Bellingham
ANALYST

Bruce Klingler
LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

The Monadnock Co.
18301 East Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

November 21, 1986

LAB NO. 6-11-12-648
PERMIT NO. .....

SAMPLE TYPE: Liquid Ex Well

SAMPLE POINT: MW-2

FLOW RATE: .....

TIME: Sample Received: 11/12/86

		Analysis
TCE	.....	0.24 mg/L
PCE	.....	0.05 mg/L
1,1,1 TCA	.....	0.08 mg/L

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

AnaCom Lab
PLATING SOLUTION ANALYSIS
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

The Monadnock Co.
18301 East Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

January 5, 1987

12-24-

LAB NO. 6-12-9-704
PERMIT NO. .....

SAMPLE TYPE: Water Sample # 1

SAMPLE POINT: MW-2

FLOW RATE: .....

TIME: Date Received: 12/9/86

		Analysis
TCE	.....	0.43 mg/L
PCE	.....	0.15 mg/L
1,1,1 TCA	.....	0.05 mg/L

cc: RW 2/20/7

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

The Monadnock Co.
18301 East Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

January 5, 1987
12-29
LAB NO. 6-12-9-705
PERMIT NO. .....

SAMPLE TYPE: Water Sample # 2

SAMPLE POINT: MW-2

FLOW RATE: .....

TIME: Date Received: 12/9/86

		Analysis
TCE	.....	0.56 mg/L
PCE	.....	0.26 mg/L
1,1,1 TCA	.....	0.06 mg/L

cc: RW 2/20/7

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

The Monadnock Co.
18301 East Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

February 12, 1987

LAB NO. 7-02-03-088
PERMIT NO. .....

SAMPLE TYPE: Sample # 1
Sample Date 1/30/87

SAMPLE POINT: MW-2

FLOW RATE: .....

TIME: Date Received: 2/3/87

		Analysis
TCE	.....	0.47 mg/L
PCE	.....	0.13 mg/L
1,1,1 TCA	.....	0.057 mg/L

CC: RW 2/20/7

Clifford J. Bellingham
ANALYST

Bruce Klingler
LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

The Monadnock Co.
18301 East Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

February 12, 1987

LAB NO. 7-02-03-089
PERMIT NO. .....

SAMPLE TYPE: Sample # 2
Sample Date 2/3/87

SAMPLE POINT: MW-2

FLOW RATE: .....

TIME: Date Received: 2/3/87

		Analysis
TCE	.....	0.62 mg/L
PCE	.....	0.19 mg/L
1,1,1 TCA	.....	0.077 mg/L

cc: RW 2/20/87

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

BROWN AND CALDWELL LABORATORIES
373 SOUTH FAIR OAKS AVENUE PASADENA CA 91105 • (818) 795-7553

ANALYTICAL REPORT

LOG NO: P87-03-504

Received: 30 MAR 87
Reported: 13 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES			DATE SAMPLED
03-504-1	BC-2	MW4	MW7	30 MAR 87
03-504-2	BC-3			30 MAR 87
03-504-3	BC-5			30 MAR 87/ML

PARAMETER	03-504-1	03-504-2	03-504-3
PCE Tetrachloroethene, ug/L	1.8	33	110
TCA 1,1,1-Trichloroethane, ug/L	0.5	3	38
TCE Trichloroethylene, ug/L	0.5	91	180
Trichlorofluoromethane, ug/L	<0.5	<0.5	<0.5
Vinyl chloride, ug/L	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene, ug/L	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene, ug/L	<0.5	<0.5	<0.5

Edward Wilson, Laboratory Director

pts / billion

BROWN AND CALDWELL LABORATORIES
373 SOUTH FAIR OAKS AVENUE PASADENA, CA 91105 • (818) 795-7553

ANALYTICAL REPORT

LOG NO: P87-03-504

Received: 30 MAR 87
Reported: 13 APR 87

Karl Anania
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3263-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
03-504-1	BC-2	30 MAR 87
03-504-2	BC-3	30 MAR 87
03-504-3	BC-5	30 MAR 87

#4 #7 #8

PARAMETER	03-504-1	03-504-2	03-504-3
Halocarbons (EPA 601)			
Date Extracted	04/02/87	04/02/87	04/02/87
Dilution Factor, Times 1	1	1	1
1,1,2,2-Tetrachloroethane, ug/L	<0.5	<0.5	<0.5
1,1,2-Trichloroethane, ug/L	<0.5	<0.5	<0.5
1,1-Dichloroethane, ug/L	<0.5	5	6
1,1-Dichloroethene, ug/L	<0.5	40	110
1,2-Dichlorobenzene, ug/L	<0.5	<0.5	<0.5
1,2-Dichloroethane, ug/L	<0.5	0.7	5
trans-1,2-Dichloroethene, ug/L	<0.5	1.5	2
1,2-Dichloropropane, ug/L	<0.5	<0.5	<0.5
1,3-Dichlorobenzene, ug/L	<0.5	<0.5	<0.5
1,4-Dichlorobenzene, ug/L	<0.5	<0.5	<0.5
2-Chloroethylvinylether, ug/L	<0.5	<0.5	<0.5
Bromodichloromethane, ug/L	<0.5	<0.5	<0.5
Bromomethane, ug/L	<0.5	<0.5	<0.5
Bromoform, ug/L	<0.5	<0.5	<0.5
Chlorobenzene, ug/L	<0.5	<0.5	<0.5
Carbon Tetrachloride, ug/L	<0.5	<0.5	<0.5
Chloroethane, ug/L	<0.5	<0.5	<0.5
Chloroform, ug/L	<0.5	0.8	1.6
Chloromethane, ug/L	<0.5	<0.5	<0.5
Dibromochloromethane, ug/L	<0.5	<0.5	10
Dichlorodifluoromethane, ug/L	<0.5	<0.5	<0.5
Methylene chloride, ug/L	<2	<2	<2

pto/Billion

[redacted] ANALYSIS
[redacted] SERVICE

The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

April 16, 1987

LAB NO. 7-03-31-237
PERMIT NO. .....

SAMPLE TYPE: Water Sample
3/31/87
FLOW RATE: .....

SAMPLE POINT: EX MW 4
TIME: Date Received: 3/31/87

	Method	Analysis
1,1,1 TCA	EPA 601	0.5 µg/L
TCE	EPA 601	1.0 µg/L
PCE	EPA 601	1.6 µg/L

ANALYST

LABORATORY DIRECTOR

SW

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

April 16, 1987

LAB NO. 7-03-31-237
PERMIT NO. .....

SAMPLE TYPE: Water Sample
3/31/87
FLOW RATE: .....

SAMPLE POINT: EX MW 7
TIME: Date Received: 3/31/87

	Method	Analysis	
1,1,1 TCA	EPA 601	48	µg/L
TCE	EPA 601	456	µg/L
PCE	EPA 601	81	µg/L

ANALYST

LABORATORY DIRECTOR

SW

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The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

April 16, 1987
LAB NO. 7-03-31-238
PERMIT NO. .....

SAMPLE TYPE: Water Sample
3/31/87
FLOW RATE: .....

SAMPLE POINT: EX MW 8
TIME: Date Received: 3/31/87

	Method	Analysis	
1,1,1 TCA	EPA 601	4.2	µg/L
TCE	EPA 601	81	µg/L
PCE	EPA 601	28	µg/L

ANALYST

LABORATORY DIRECTOR

SW

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

May 11, 1987

LAB NO. 7-04-28-296
PERMIT NO. .....

SAMPLE TYPE: Well Water Sample

SAMPLE POINT: Monitoring Well # 1
Obtained by Customer

FLOW RATE: .....

TIME: Date Received 4/28/87

EPA Method 601

		Analysis	
PCE	.....	0.55	~~ug~~/L
TCE	.....	1.5	~~ug~~/L
1,1,1 TCA	.....	0.3	~~ug~~/L

ANALYST

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

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The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

May 11, 1987

LAB NO. 7-04-28-297
PERMIT NO. .....

SAMPLE TYPE: Well Water Sample

SAMPLE POINT: Monitoring Well # 2
Obtained by Customer

FLOW RATE: .....

TIME: Date Received 4/28/87

EPA Method 601

		Analysis	
PCE	.....	312	~~ug~~/L
TCE	.....	473	~~ug~~/L
1,1,1 TCA	.....	83.4	~~ug~~/L

ANALYST

LABORATORY DIRECTOR

SW

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA

5/20

The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

May 11, 1987

LAB NO. 7-04-28-298
PERMIT NO. .....

SAMPLE TYPE: Well Water Sample

SAMPLE POINT: Monitoring Well # 4
Obtained By Customer

FLOW RATE: .....

TIME: Date Received 4/28/87

EPA Method 601

		Analysis	
PCE	.....	1.2	ug/L
TCE	.....	0.1	ug/L
1,1,1 TCA	.....	0.4	ug/L

Richard J. Bellingham
ANALYST

Bruce Klingler
LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

5/26

The Monadrock Co.
18301 E. Arenth Ave
City of Industry, CA 91749
ATTENTION: Jim Daunt

May 11, 1987

LAB NO. 7-04-28-299
PERMIT NO. .....

SAMPLE TYPE: Well Water Sample

SAMPLE POINT: Monitoring Well # 7
Obtained by Customer

FLOW RATE: .....

TIME: Date Received 4/28/87

EPA Method 601

		Analysis	
PCE	.....	122	ug/L
TCE	.....	485	ug/L
1,1,1 TCA	.....	57.7	ug/L

ANALYST

SW

LABORATORY DIRECTOR

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA.

AnaCon Labs
PLATING SOLUTION ANALYSIS
METAL FINISHING SOLUTION ANALYSIS
24 HOUR SERVICE

The Monadnock Co.
18301 E. Arenth Ave.
City of Industry, CA 91749
ATTENTION: Jim Daunt

May 11, 1987

LAB NO. 7-04-28-300
PERMIT NO. .....

SAMPLE TYPE: Well Water Sample

SAMPLE POINT: Monitoring Well # 8
Obtained by Customer

FLOW RATE: .....

TIME: Date Received 4/28/87

EPA Method 601

		Analysis	
PCE	.....	22.3	ug/L
TCE	.....	68.6	ug/L
1,1,1 TCA	.....	4.3	ug/L

ANALYST

LABORATORY DIRECTOR

SW

All test methods are in accordance to current editions of Standard and Methods for Chemical Analysis of Water and Wastes, EPA